USER'S GUIDE

DURALAN™ FAST ETHERNET NICS

ANA™-69000/62000 FAMILY

Downloaded from www.Manualslib.com manuals search engine

Adaptec, Inc.
691 South Milpitas Boulevard
Milpitas, CA 95035

© 1999 Adaptec, Inc.
All rights reserved. Adaptec, and the Adaptec logo are trademarks of Adaptec, Inc. which may be registered in some jurisdictions.

Printed in Singapore
STOCK NO.: 512293-00, Rev. A DK 4/99

Downloaded from www.Manualslib.com manuals search engine

DuraLAN™ Fast Ethernet NICs Including Duralink64™ Software

ANA™-69000/62000 Family

User's Guide

adaptec®

Downloaded from www.Manualslib.com manuals search engine

Copyright

© 1999 Adaptec, Inc. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written consent of Adaptec, Inc., 691 South Milpitas Blvd., Milpitas, CA 95035.

Trademarks

Adaptec, the Adaptec logo, ANA, Duralink, and DuraLAN are trademarks of Adaptec, Inc. which may be registered in some jurisdictions.

Windows NT is a trademark, Windows, Windows 95, and Windows 98 are registered trademarks of Microsoft Corporation in the U.S. and other countries used under license.

EtherChannel is a registered trademark of Cisco Systems, Inc.

NetWare is a registered trademark of Novell, Inc.

All other trademarks are owned by their respective owners.

Changes

The material in this document is for information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, Adaptec, Inc. assumes no liability resulting from errors or omissions in this document, or from the use of the information contained herein.

Adaptec reserves the right to make changes in the product design without reservation and without notification to its users.

Adaptec Technical Support and Services

If you have questions about installing or using your Adaptec product, check this user's guide first—you will find answers to most of your questions here. If you need further assistance, please contact us. We offer the following support and information services:

Electronic Support

Technical information, including product literature, answers to commonly asked questions, information on software upgrades and other topics is available electronically through the following:

- Adaptec World Wide Web (WWW) site at http://www.adaptec.com.
- File Transfer Protocol (FTP) server at ftp.adaptec.com.
- Adaptec USA Bulletin Board Service (BBS) at 408-945-7727; supports up to 28,800 bps (bits per second), 8 data bits, 1 stop bit, no parity. No product literature is available on the Adaptec BBS.
- Interactive Fax System at 303-684-3400; available 24 hours a day, 7 days a week.

Downloaded from www.Manualslib.com manuals search engine

Technical and Product Support

- For technical support and information about many of Adaptec's electronic support services, call 800-959-7274 or 408-945-2550, 24 hours a day, 7 days a week. The system prompts you with questions regarding your problem and then provides step-by-step troubleshooting instructions.
- To submit your electronic mail message to Adaptec Technical Support use the product support information Webmail form at http://www.adaptec.com/support/webmail.html.
- To speak with a product support representative, call 408-934-7274, M–F, 6:00 A.M. to 5:00 P.M., Pacific Time. After hours, on weekends, and on holidays, product support is also available for a fee at 800-416-8066.

Sales and Ordering Information

- For sales information, call 800-959-7274 or 408-945-2550, M–F, 6:00 A.M. to 5:00 P.M., Pacific Time.
- To order Adaptec software and SCSI cables, call 800-442-7274 or 408-957-7274, M-F, 6:00 A.M. to 5:00 P.M., Pacific Time.
- To request additional documentation for Adaptec products, call 800-934-2766 or 510-732-3829, M–F, 6:00 A.M. to 5:00 P.M., Pacific Time.

Class B Device Certification Statements

Federal Communications Commission Radio Frequency Interference Statement

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. However, if this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.
- Use a shielded and properly grounded I/O cable and power cable to ensure compliance of this unit to the specified limits of the rules.

Downloaded from www.Manualslib.com manuals search engine

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Adaptec, Inc.	ANA-62011 ANA-69011 ANA-62022 ANA-62044

Tested To Comply With FCC Standards

FOR HOME OR OFFICE USE

Canadian Compliance Statement

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matérial brouilleur du Canada

European Compliance Statement

WARNING: This is a Class B product. In domestic environments this product may cause radio interference in which case the user may be required to take adequate measures.

Safety Standards

These products meet the following national and international regulations:

- UL 1950 Standard for Safety of Information Processing and Business Equipment
- IEC 950 Safety of Information Technology Equipment in Electrical Business Equipment
- CAN/CSA-C22.2 # 950 Safety of Information Technology Equipment including Electrical Business Equipment

To ensure safe operating conditions, it is recommended that these products be installed in UL Listed computers.

Downloaded from www.Manualslib.com manuals search engine

Limited Warranty

SOFTWARE. Adaptec, Inc. warrants to you that for a period of ninety (90) days from the date you receive this software Product the magnetic media contains an accurate reproduction of the Software. This limited warranty covers only the original user of the Product. If the Product media should become defective within the warranty period, Adaptec at its option, will repair or replace the Product media, provided it is delivered at your expense to Adaptec as provided below. Adaptec does not warrant that the product will be free from error or will meet your specific requirements. Except for the warranties set forth above, the Product is licensed "AS IS", and ADAPTEC DISCLAIMS ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

HARDWARE. Adaptec, Inc. warrants to the original purchaser of this hardware Product that it will be free from defects in workmanship and materials, under normal use and service, for the lifetime of the personal computer in which it is installed from the date of purchase from Adaptec or its authorized dealer. In order for this warranty to be valid, this Product must remain in its original personal computer and be registered with Adaptec within one year of purchase. Otherwise, Adaptec warrants to the original purchaser of this Product that it is to be free from defects in workmanship and materails, under normal use and service, for a period of five (5) years from the date of purchase from Adaptec or an authorized dealer. Should this Product, in Adaptec's opinion, fail to meet this warranty during the applicable warranty period, Adaptec will, at its expense and option, repair the defective Product or part or replace the defective item with an equivalent product or part, or refund the purchase price. All returned Products will become the property of Adaptec. At Adaptec's option, replacement Products or parts may be new or reconditioned. Any replaced Product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer. Such remedy is your sole and exclusive remedy for breach of the above warranty.

LIMITED WARRANTY SERVICE. Products requiring limited warranty service during the applicable warranty period should be delivered to Adaptec's U.S. headquarters with proof of purchase. Products returned to Adaptec must be pre-authorized with a Return Material Authorization (RMA) number marked on the outside of the package, and packaged in the original (or equivalent) packaging material. If the delivery is by mail, you agree to insure the Product or assume the risk of loss or damage in transit. You also agree to prepay shipping charges to Adaptec. The repaired or replaced item, or refund, will be shipped to the Customer, at Adaptec's expense, not later than thirty (30) days after receipt by Adaptec.

GENERAL. This limited warranty does not extend to any Product which has been damaged as a result of accident, misuse, abuse, or as a result of unauthorized service or parts. Incidental or consequential damages, including without limitation loss of data, arising from breach of any express or implied warranty are not the responsibility of Adaptec and, to the extent permitted by law, are hereby excluded both for property damage, and, to the extent not unconscionable, for personal injury damage. Some states do not allow the exclusion or limitation of incidental or consequential damages for consumer products, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

For more information on how to obtain warranty service, write or telephone Adaptec at 691 South Milpitas Boulevard, Milpitas, CA 95035, (800) 959-7274.

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

▼▼▼▼ Contents

Part 1 Introduction to DuraLAN

1 Getting Started

System Requirements 1-2
Hardware Requirements 1-2
Software Requirements 1-2
Fast Ethernet 1-3
Adaptec DuraLAN NICs 1-3
Duralink64 Failover 1-6
Duralink64 Port Aggregation 1-7
FEC (Fast EtherChannel) 1-8
Advisories 1-9

2 Introduction to Duralink64 Port Aggregation

Traditional Network Configurations 2-2
Servers with Duralink64 Port Aggregation 2-5
Duralink64 Port Aggregation Example 2-5

Part 2 Installing the DuraLAN NIC

3 DuraLAN NIC Installation

Important Note for Windows 95 Users! 3-2
Installing the Appropriate NIC 3-3
Installing the DuraLAN NIC 3-4

Downloaded from www.Manualslib.com manuals search engine

Connecting the Network Cable 3-6
Installing the Appropriate NIC Driver 3-7

4 Network Configuration Examples

Network Without Duralink64 Failover Protection 4-2
Single Hub or Switch on an Ethernet Segment 4-3
Dual Hubs 4-4
Dual Hubs with an Ethernet Switch 4-5
Dual Hubs with Routers 4-6
Dual Hubs with a Four-Port NIC 4-7

Part 3 The DuraLink64 Driver for Windows

5 Duralink64 Driver Installation for Windows

Before You Begin 5-2
Note on DuraLAN NIC Ports 5-2
Installing the DuraLAN Driver 5-3
Windows NT 4.0 5-3
Windows NT 3.51 5-6
Windows 98 5-8
Windows 95 5-9
Windows 95 OSR2 5-9
Windows 95 OSR1 5-10
Installation Tips 5-11
Windows 95 5-11
Windows 98 5-12
Windows Clients Using Novell Client32 5-12
Removing Previously Installed Drivers 5-13
Windows NT 4.0 5-13
Windows NT 3.51 5-14
Windows 98 and 95 OSR1/OSR2 5-14

Downloaded from www.Manualslib.com manuals search engine

6 Duralink64 Standard Driver for Windows

Configuring the Standard Driver Ports in Windows NT 4.0 and 3.51 6-2
Configuring the Ports in Windows 98/95 6-4

7 Duralink64 Failover for Windows NT

Configuring the Ports 7-2
Creating the Failover Pair 7-3
- Windows NT 4.0 7-3
- Windows NT 3.51 7-6

Monitoring Failover Pairs 7-8
Note on DuraLAN NIC Ports 7-8

8 Duralink64 Port Aggregation for Windows NT

Configuring the Ports 8-2
Creating Port Aggregation Groups 8-4
Creating Fast EtherChannel Groups 8-8
Assigning the TCP/IP Address 8-11
Modifying Groups 8-13
- Renaming Groups 8-13
- Adding or Removing Ports 8-14

Checking System Status 8-17
- Understanding the Status Tab 8-18
  - Field Descriptions 8-18
  - Viewing the Groups 8-19

Windows NT Performance Monitor 8-20

Downloaded from www.Manualslib.com manuals search engine

Part 4 The Duralink64 Driver for NetWare

9 Duralink64 Standard Driver for NetWare

Before you Begin 9-2
Note on NetWare 9-2
Install of Duralink64 Driver during NetWare 5.0 Operating System Installation 9-3
Installing the NetWare Standard Driver 9-4
Configuring the Ports 9-5
Assigning the Protocols 9-7
Viewing the Configuration 9-10
Restarting the Server 9-11
Troubleshooting Tip 9-11
Removing Drivers 9-12
Removing the DuraLAN Standard Driver 9-12

10 Duralink64 Failover for NetWare

Before you Begin 10-2
Note on NetWare 10-2
Installing the NetWare Failover Driver 10-3
Configuring the Ports 10-4
Creating the Failover Pairs 10-6
Assigning the Protocols 10-9
Viewing the Configuration 10-12
Copying and Saving the Configuration 10-13
Viewing the System Status 10-14
Element Descriptions 10-15
F Keys 10-15
Modifying the Driver Configuration 10-16
Removing Drivers 10-17
Removing the Duralink64 Failover Driver 10-17

Downloaded from www.Manualslib.com manuals search engine

11 Duralink64 Port Aggregation for NetWare

Before you Begin 11-2
Note on NetWare 11-2
Installing the NetWare Port Aggregation Driver 11-3
Configuring Ports 11-4
Creating Port Aggregation Groups 11-6
Creating Fast EtherChannel Groups 11-9
Assigning Protocols 11-12
Verifying Configuration 11-15
    Copying and Saving the Configuration 11-16
Viewing System Status 11-17
    System Status Data 11-17
    Setting Time Intervals 11-18
Modifying Driver Configurations 11-18
Removing Drivers 11-19
    Removing the Duralink64 Port Aggregation Driver 11-19

12 Installing Duralink64 NetWare Client

Installing Novell Client32 12-2
    DOS 12-2
        Selecting Options 12-3
        Editing startnet.bat 12-4
        Connecting Clients to the NetWare Server 12-4
    Windows 12-5
        Connecting Clients to the NetWare Server 12-5
Connecting Clients to the NetWare Failover Server 12-6
Connecting Clients to the NetWare
  Port Aggregation Server 12-7

Downloaded from www.Manualslib.com manuals search engine

Part 5 Appendices

A Cables and LEDs

Connection Types A-2
Full Duplex Support A-2
Cable Requirements A-3
Straight-through Cable A-4
Pinout and Color Requirements A-5
Diagnostics Loop-Back Cable A-5
Diagnostic LEDs A-6
LED Functions A-7

B Troubleshooting Tips

Isolating Faulty Hardware B-2
Troubleshooting B-2
Configuring the BIOS B-4
Frequently Asked Questions B-5
Duralink64 Software And DuraLAN NICs - General Questions B-5
Duralink64 v4.2 Failover Software Questions B-7
Duralink64 v4.2 Port Aggregation Software Questions .. B-8
Duralink64 v4.2 Windows NT - General Questions B-10
Duralink64 v4.2 Windows 95 and Windows 98 - General Questions B-11
Windows 95 ..... B-11
Windows 98 ..... B-12
Duralink64 v4.2 NetWare - General Questions B-12

C Duralink SNMP Agents

Monitoring the NICs by SNMP C-2
SNMP Support C-2

Downloaded from www.Manualslib.com manuals search engine

D The Diagnostics Utility

Running the Diagnostics D-2
From the Hard Drive D-2
From the Floppy Drive D-2
Diagnostic Tests D-3

Index

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

▾▾▾▾ Part 1

Introduction to DuraLAN

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

1

Getting Started

In This Chapter

System Requirements	1-2
Fast Ethernet	1-3
Adaptec DuraLAN NICs	1-3
Duralink64 Failover	1-6
Duralink64 Port Aggregation	1-7
FEC (Fast EtherChannel)	1-8
Advisories	1-9

This user's guide describes how to install and configure Adaptec® DuraLAN™ Fast Ethernet network interface cards (NICs). Please review the system requirements before you begin.

User's guide summary:

- Part 1, *Introduction to DuraLAN*, describes how to install your Adaptec DuraLAN NIC.
- Part 2, *Installing the DuraLAN NIC*, describes how to install and configure the DuraLAN Standard NIC driver in NetWare and Windows® environments.
- Part 3, *The DuraLink64 Driver for Windows*, describes how Duralink64™ Failover adds value to your network and provides installation instructions for Windows® NT and NetWare-based servers.

Downloaded from www.Manualslib.com manuals search engine

- Part 4, *The Duralink64 Driver for NetWare*, describes how to create a virtual port by grouping ports to maximize bandwidth for your mission-critical applications.
- Part 5, *Appendices*, provides supplemental information that may be required for a proper installation.

System Requirements

Hardware Requirements

The minimum hardware system requirements for using the Adaptec DuraLAN NIC are as follows:

System Component	Requirements
NIC	■ Available bus mastering PCI slot. ■ The most recent PCI system BIOS is recommended. ■ Intel x86 platform with single or multiprocessor. ■ 16-MByte RAM.
Two and Four Port NICs	■ System BIOS supporting PCI-to-PCI bridge chip. ■ Multiport NICs require PCI 2.1 compliant bus.

Software Requirements

The minimum software system requirements are as follows:

- **Windows**—Windows NT 3.51 or 4.0 Workstation or Server, Windows® 95, or Windows® 98.
- **NetWare**—NetWare 4.x or 5.0.

Downloaded from www.Manualslib.com manuals search engine

Fast Ethernet

Fast Ethernet is a networking standard defined by the Institute of Electrical and Electronic Engineers (IEEE) in the IEEE 802.3u Specification. Fast Ethernet runs at 100 Mbps, or at 200 Mbps in Full Duplex mode.

Fast Ethernet uses the same Carrier Sense Multiple Access with Collision Detection (CSMA/CD) architecture used on 10BASE-T and 10BASE-2 10 Mbps network specifications, which allows for easy integration with existing networks.

Adaptec DuraLAN NICs

Note: 64-bit NICs will also work in 32-bit PCI slots.

Adaptec provides the following PCI 10/100 DuraLAN Fast Ethernet NIC models:

- ANA-69011/TX Single32™—a single-port 32-bit NIC supporting autosensing between 10 and 100-Mbps line speeds.

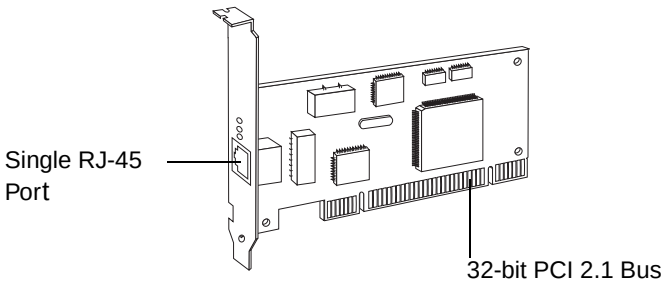

Figure 1-1. ANA-69011/TX Single32™ DuraLAN NIC

Downloaded from www.Manualslib.com manuals search engine

- **ANA-62011**/TX Single64™—a single-port 64-bit/32-bit NIC supporting autosensing between 10 and 100-Mbps line speeds.

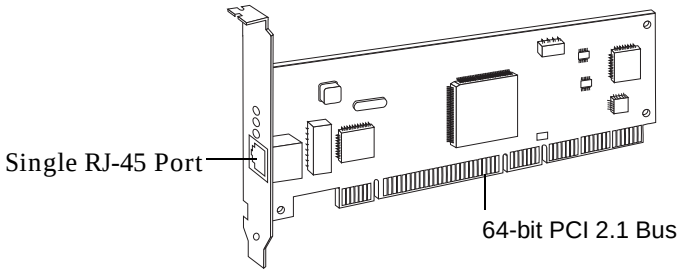

Figure 1-2. ANA-62011/TX Single64 DuraLAN NIC

- **ANA-62022**—a two-port NIC that offers two high-performance 10/100 Fast Ethernet ports on a single 64-bit/32-bit NIC. Each port runs at independent speeds for maximum flexibility. This NIC supports Full Duplex to deliver speeds up to 400-Mbps cumulative throughput.

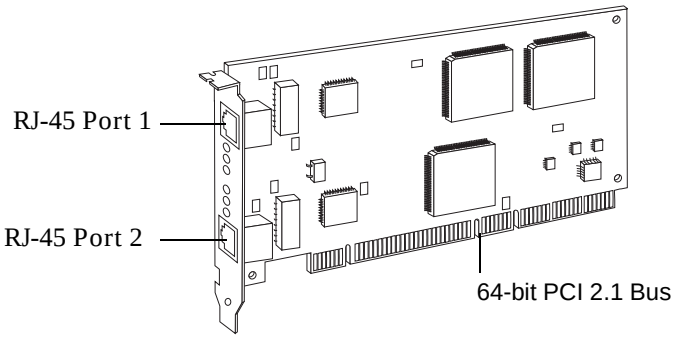

Figure 1-3. ANA-62022 DuraLAN NIC

Downloaded from www.Manualslib.com manuals search engine

- **ANA-62044**—a four-port NIC that offers four high performance 10/100 Fast Ethernet ports on a single 64-bit/32-bit NIC. Each port runs at independent speeds for maximum flexibility. This NIC supports Full Duplex to deliver speeds up to 800-Mbps cumulative throughput.

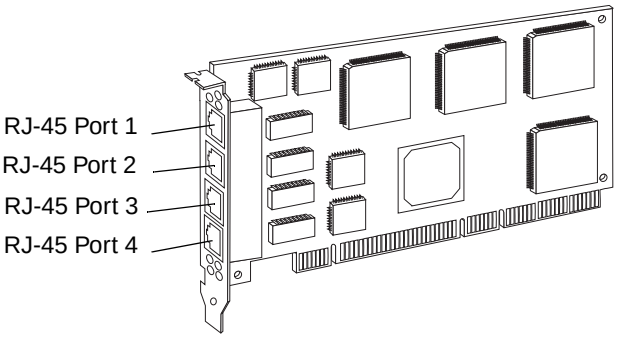

Figure 1-4. ANA-62044 DuraLAN NIC

Downloaded from www.Manualslib.com manuals search engine

Duralink64 Failover

Duralink64 Failover software provides protection from network-link failures on Fast Ethernet servers running mission-critical applications. During a port failure, Duralink64 Failover keeps the connection to the server live by moving all traffic on the affected segment to a backup port. When a failure is detected on the primary port, that port is disabled and the backup port takes over to continue data transmission, keeping the connection running without interruption.

Duralink64 Failover is often used in a troubled environment to provide failover capabilities when any of the following conditions exist:

- An Ethernet link loss
- A watchdog timer expires
- An abnormal hardware interrupt occurs
- Abnormal Send/Receive counters, such as too many collisions or errors occur on the segment

Duralink64 Failover supports Windows NT 4.0 and 3.51, and Novell NetWare 4.x and 5.0 based servers.

Duralink64 Failover is compatible with Adaptec ANA™-69011/TX and ANA-62011/TX single-port NICs, ANA-62022 two-port NICs, and ANA-62044 four-port NICs.

Downloaded from www.Manualslib.com manuals search engine

Duralink64 Port Aggregation

Duralink64 Port Aggregation is a software package that provides network path redundancy and increased bandwidth for Fast Ethernet servers running mission-critical applications. Duralink64 Port Aggregation works by load balancing the throughput over multiple ports.

With Duralink64 Port Aggregation, you can create a virtual port by grouping multiple ports together. This grouping distributes the network load by sharing the resources of all ports in a group. In the Port Aggregation group, one port becomes the “primary” port and its MAC address is given to the protocol. Thus, the group behaves as a single interface, allowing the software to manage the combined resources of the group efficiently. In the event of a port failure, the remaining ports carry the load and keep the network running and uninterrupted.

Duralink64 Port Aggregation supports Windows NT 4.0 and 3.51, and Novell NetWare 4.x and 5.0 -based servers.

Duralink64 Port Aggregation is compatible with Adaptec ANA-69011/TX and ANA-62011/TX single-port NICs, ANA-62022 dual-port NICs, and ANA-62044 quad-port NICs.

Downloaded from www.Manualslib.com manuals search engine

FEC (Fast EtherChannel)

Fast EtherChannel® (FEC) is a technology developed by Cisco Systems based on standard Fast Ethernet used in parallel to provide the additional bandwidth network backbones required today. FEC combines two or four Fast Ethernet links to single logical connection capable of carrying 800 Mbits / sec of aggregate full-duplex throughput. In addition to scalable bandwidth, the technology also provides fault tolerance and resiliency, protecting the network from outages due to failed links.

Fast EtherChannel allows grouping of DuraLAN ports or NICs allowing full utilization of available bandwidth (up to 800 Mbits / sec). Up to four single port NICs, 2 two port NICs, or 1 four port NIC can be grouped. This technology also provides load balancing and management of each link by distributing traffic across multiple links in the channel. In addition, FEC technology provides redundancy in the event of link failure.

Duralink64 v4.2 software and all of Adaptec DuraLAN NICs support Fast EtherChannel technology, allowing redundancy and high-speed aggregation between switches and servers.

Fast EtherChannel is available on select Cisco Catalyst switches and Cisco routers.

For additional information on Cisco's Fast EtherChannel technology, visit the Cisco Systems web site:
http://www.cisco.com/warp/public/729/fec

Downloaded from www.Manualslib.com manuals search engine

Advisories

This document includes three kinds of advisories.

Note: Notes are reminders, tips, or suggestions that might simplify the procedures included in this document.

Caution: Cautions alert you to actions that might cause damage to your system or your data.

WARNING: Warnings alert you to actions that might cause injury to you or someone else.

To avoid injury to people or damage to equipment and data, be sure to follow the cautions and warnings in this document. Adaptec does not claim to have included in this document every condition or situation that might require a caution or warning notice. Be sure to consult the documentation for your computer and any connected equipment when you are installing the equipment or changing its configuration.

WARNING: *Always* use caution when handling electrical equipment!

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

2

Introduction to Duralink64 Port Aggregation

In this Chapter

Traditional Network Configurations	2-2
Servers with Duralink64 Port Aggregation	2-5

This chapter compares traditional Ethernet configurations to Ethernet servers using Duralink64 Port Aggregation. These examples show the impact Duralink64 Port Aggregation has on network performance and hardware investment.

Downloaded from www.Manualslib.com manuals search engine

Traditional Network Configurations

The following three examples show some typical configuration methods.

The figure below illustrates a single segment server initialized at 100 Mbps with Full Duplex Ethernet (FDE). In this example, the segmented server is limited to 200 Mbps. In addition, if the connection to the server fails, the network may go down.

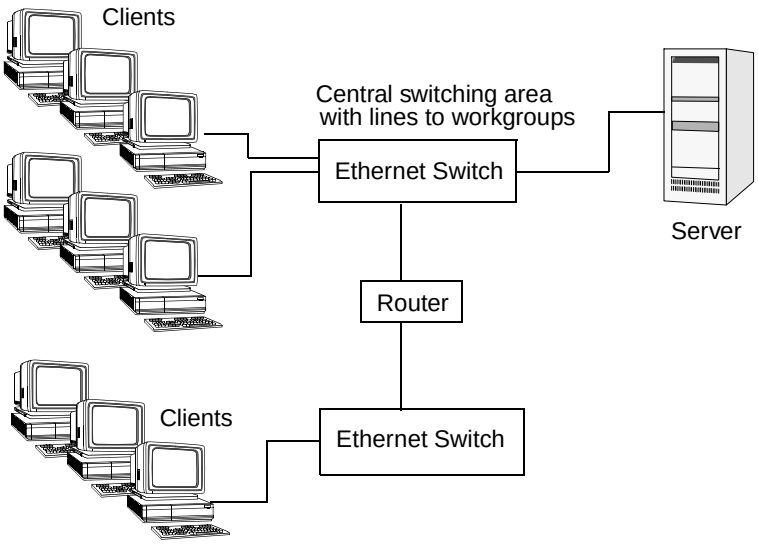

Figure 2-1. Single Segment Server

Downloaded from www.Manualslib.com manuals search engine

The next traditional method provides network *Fault Tolerance* through doubling the hardware and addition of a special version of NetWare (SFT3). Data is kept current between servers via a Mirrored Server Link (MSL). In the illustration below, one server is active while the other is ready to take over all duties if the other fails.

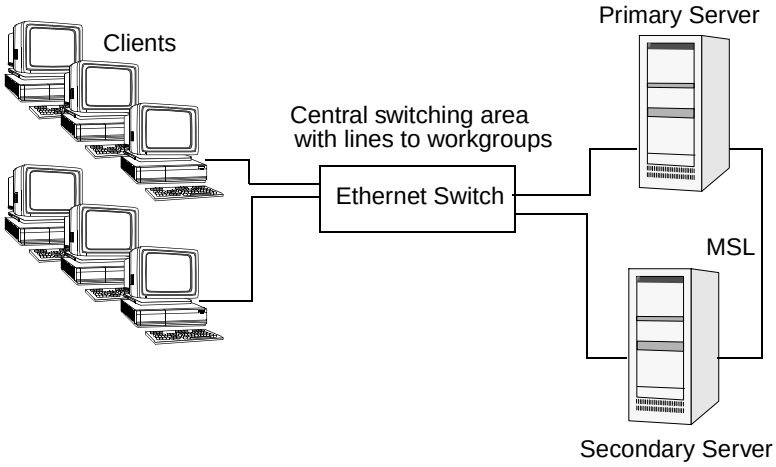

Figure 2-2. Fault Tolerance Using NetWare

Downloaded from www.Manualslib.com manuals search engine

The illustration below illustrates a configuration with Windows NT Server (Wolfpack).

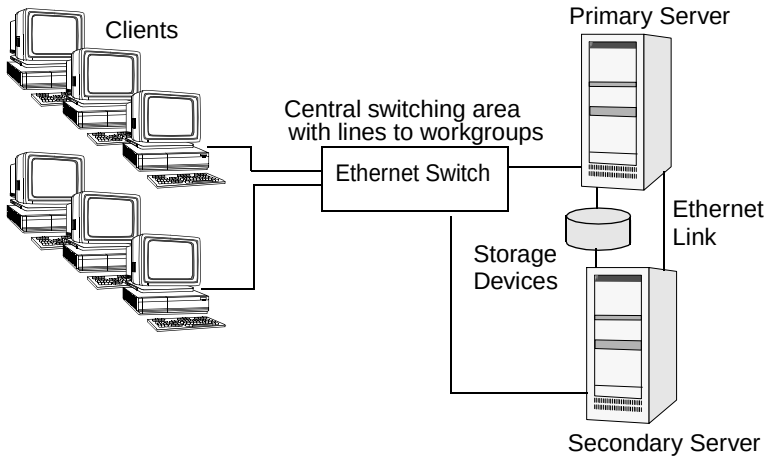

Figure 2-3. Fault Tolerance Using NT

Downloaded from www.Manualslib.com manuals search engine

Servers with Duralink64 Port Aggregation

A server with Duralink64 Port Aggregation can use up to 12 Adaptec PCI Fast Ethernet ports in one aggregated group (at 1.2 Gbps per group).

If any of the contributing members of a specific aggregated group should fail, that member is excluded from the group. The remaining ports balance the existing load.

Duralink64 Port Aggregation Example

The illustration below illustrates a server with 12 ports from three Adaptec ANA-62044 NICs. With this configuration, the server has a cumulative bandwidth of 1.2 Gbps on its single virtual segment (200 Mbps per port). Further, the network segment is fault tolerant, enabling the network to remain alive should any port fail.

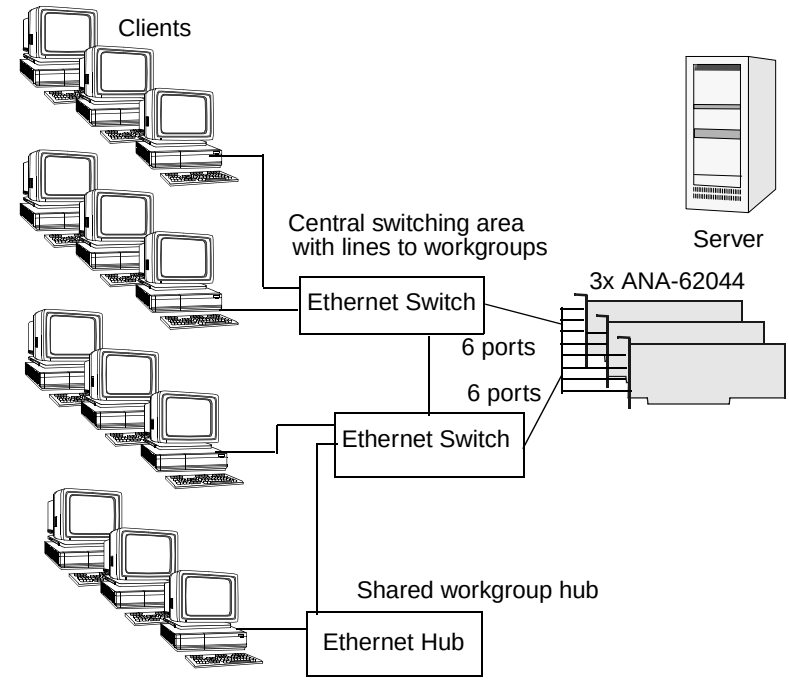

Figure 2-4. Port Aggregation

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

▼▼▼▼ Part 2

Installing the DuraLAN NIC

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

3

DuraLAN NIC Installation

In This Chapter

Important Note for Windows 95 Users!	3-2
Installing the Appropriate NIC	3-3
Installing the DuraLAN NIC	3-4
Connecting the Network Cable	3-6
Installing the Appropriate NIC Driver	3-7

This chapter provides instructions on installing your Adaptec DuraLAN NIC. If you are a Windows 95 user, please read *Important Note for Windows 95 Users!* before proceeding with this installation.

Downloaded from www.Manualslib.com manuals search engine

Important Note for Windows 95 Users!

Before installing the DuraLAN NIC, verify which version of Windows 95 is installed. (You either have OSR1 or OSR2.) You will need to know which version you have if you install the DuraLAN Standard driver. Use the following instructions for help:

1. Start Windows 95.
2. Click the **Start** menu, point to **Settings**, and then click **Control Panel**.
3. Double-click the **System** icon. The General tab displays your version of Windows 95.

Windows 95 Versions	
4.00.950	OSR1
4.00.950A	OSR1
4.00.950B	OSR2
4.00.950C	OSR2

4. Click **OK** to exit the General tab.
5. Shut down the system, and then turn OFF power.
6. Continue with *Installing the DuraLAN NIC* on page 3-4.

Downloaded from www.Manualslib.com manuals search engine

Installing the Appropriate NIC

The following table describes which DuraLAN NIC to install for your operating system and Adaptec driver.

	DuraLAN Standard driver	Duralink64 Failover	Duralink64 Port Aggregation/Cisco's Fast Ethernet Channel
Windows 95 OSR1[1]	ANA-69011/TX ANA-62011/TX ANA-62022 ANA-62044		
Windows 95 OSR2[1]	ANA-69011/TX ANA-62011/TX ANA-62022 ANA-62044		
Windows 98	ANA-69011/TX ANA-62011/TX ANA-62022 ANA-62044		
Windows NT Workstation	ANA-69011/TX ANA-62011/TX ANA-62022 ANA-62044	ANA-69011/TX[2] ANA-62011/TX[2] ANA-62022 ANA-62044	ANA-69011/TX[2] ANA-62011/TX[2] ANA-62022 ANA-62044
Windows NT Server 3.51/4.0	ANA-69011/TX ANA-62011/TX ANA-62022 ANA-62044	ANA-69011/TX[2] ANA-62011/TX[2] ANA-62022 ANA-62044	ANA-69011/TX[2] ANA-62011/TX[2] ANA-62022 ANA-62044
NetWare 4.x and 5.0	ANA-69011/TX ANA-62011/TX ANA-62022 ANA-62044	ANA-69011/TX[2] ANA-62011/TX[2] ANA-62022 ANA-62044	ANA-69011/TX[2] ANA-62011/TX[2] ANA-62022 ANA-62044

[1] Windows 95 OSR1 and OSR2 use two different Adaptec drivers, see the appropriate installation instructions.
[2] Requires at least two DuraLAN NICs.

Downloaded from www.Manualslib.com manuals search engine

Installing the DuraLAN NIC

WARNING: Before you begin, turn OFF power to the PC, and disconnect the power cord!

1. Ground yourself by touching an unpainted surface of the PC case.
2. Remove the cover from your computer. Refer to the manufacturer's documentation for help.
3. Locate an unused PCI expansion slot.
   - For best performance, install the 64-bit DuraLAN NIC in a 64-bit PCI expansion slot. (32-bit PCI expansion slots may be used also.)
   - Some noncompliant 32-bit PCI expansion slots *do not* support 64-bit NICs. This is because the slot's outside notch is not deep enough to allow the bus contacts to fit around the slot. If the 64-bit DuraLAN NIC does not fit in the slot, please return to your purchase location for replacement with a 32-bit DuraLAN NIC.
4. Unscrew the bracket screw, and then remove the expansion slot bracket cover.

   Note: PCI slots and NICs come in two varieties: 3.3-volt, and the more common 5-volt. All Adaptec PCI NICs support 5-volt and 3.3-volt slots.

5. Carefully remove the DuraLAN NIC from its antistatic container.
6. Verify the model name on the NIC (such as, ANA-69011/TX, ANA-62011/TX, etc.).
7. Check the NIC for any visible signs of damage which may have occurred during shipment. If you find a problem, immediately notify your network supplier and the shipping service which delivered your NIC.
8. Insert the NIC into the expansion slot, pressing down firmly until the bus contacts are seated in the slot.

Downloaded from www.Manualslib.com manuals search engine

9 Replace the screw that was removed in step 4, see the figure below.

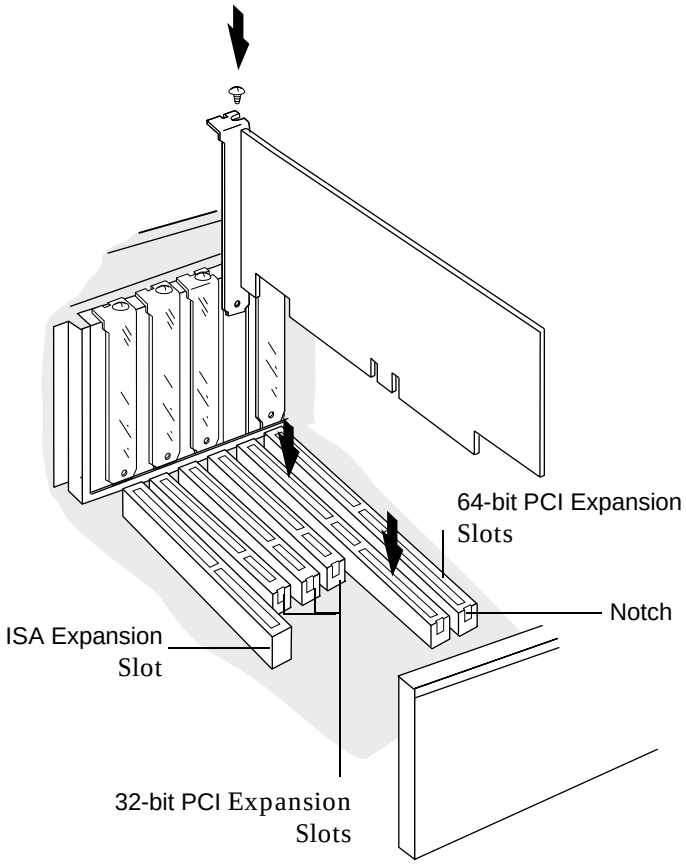

Figure 3-1. Install the DuraLAN NIC in a 64-bit PCI expansion slot.

10 Replace the computer cover.

11 Continue with *Connecting the Network Cable* on page 3-6.

Downloaded from www.Manualslib.com manuals search engine

Connecting the Network Cable

Cable requirements for Adaptec DuraLAN NICs vary according to network speed, cabling standard, and the connector to be used. See Appendix A, *Cables and LEDs* for detailed information on cabling.

1. Determine the appropriate cabling for your network.
2. Connect the cable to the NIC connector. (For multiport NICs, connect a cable to each port.)
3. Connect the other end of the cable to your hub, switch, or client.
4. Continue with *Installing the Appropriate NIC Driver*.

Downloaded from www.Manualslib.com manuals search engine

Installing the Appropriate NIC Driver

After installing the DuraLAN NIC, you must install the appropriate DuraLAN NIC driver. You may install one of three drivers: the DuraLAN Standard driver, Duralink64 Failover, *or* Duralink64 Port Aggregation. Please note that you may install one type only.

The Adaptec Duralink64 diskettes provide the following drivers:

Disk 1	Disk 2
Windows NT 4.0 Standard Driver	NetWare 4.x and 5.0 Standard Driver
Windows NT 3.51 Standard Driver	Client32 for DOS
Windows 95 Standard Driver	NetWare Failover Driver
Windows 98 Standard Driver	DOS Diagnostics
Windows NT 4.0 Failover Driver	NetWare Port Aggregation\Fast EtherChannel Driver
Windows NT 3.51 Failover Driver	
Windows NT 4.0 Port Aggregation\Fast EtherChannel Driver	
Windows NT 3.51 Port Aggregation\ Fast EtherChannel Driver	

Downloaded from www.Manualslib.com manuals search engine

- **DuraLAN Standard driver**

  The Standard driver uses each DuraLAN port independently.

  Note: Windows 95, Windows 98, and Novell Client32 *do not* support Duralink64 Failover. Install the DuraLAN Standard driver for these operating systems.

- **Duralink64 Failover driver**

  The Duralink64 Failover driver groups two ports in a failover combination, one as the primary port and the other as the backup port. The ports may be connected to a hub or switch. describes this software.

- **Duralink64 Port Aggregation\Fast EtherChannel driver**

  The Duralink64 Port Aggregation driver groups up to twelve ports together and must be used with a switch. Fast EtherChannel can be grouped in groups of two or four. This grouping requires a switch that supports Fast EtherChannel.

Always use the latest software version available for your DuraLAN NIC. Drivers are updated regularly on Adaptec's World Wide Web, FTP, and BBS sites to provide enhanced performance and new features. See *Technical and Product Support* on page iii.

❒

Downloaded from www.Manualslib.com manuals search engine

4

Network Configuration Examples

In This Chapter

Network Without Duralink64 Failover Protection	4-2
Single Hub or Switch on an Ethernet Segment	4-3
Dual Hubs	4-4
Dual Hubs with an Ethernet Switch	4-5
Dual Hubs with Routers	4-6
Dual Hubs with a Four-Port NIC	4-7

This chapter describes the benefits of using Duralink64 Failover and some typical network configurations. The primary and backup Adaptec DuraLAN Fast Ethernet NICs or ports reside in the server. Duralink64 Failover operates on these NICs to provide redundancy on the server. The backup port does not operate until the primary port fails.

Downloaded from www.Manualslib.com manuals search engine

Network Without Duralink64 Failover Protection

This configuration uses one NIC connected to a hub or switch on an Ethernet segment. If the NIC fails, all network traffic is stopped.

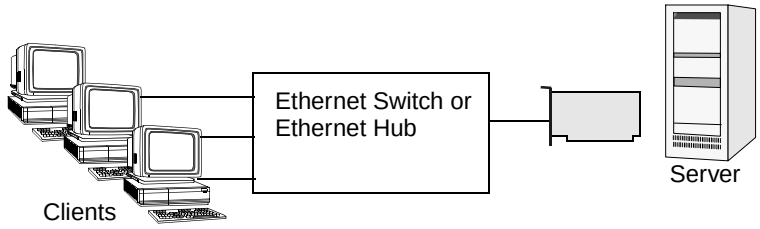

Figure 4-1. Network without Duralink64 Failover protection

Downloaded from www.Manualslib.com manuals search engine

Single Hub or Switch on an Ethernet Segment

This configuration uses two NICs connected to a hub or switch on an Ethernet segment. Duralink64 Failover provides failover capability if one NIC fails.

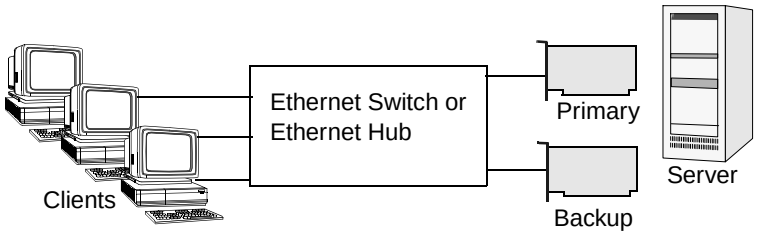

Figure 4-2. Single hub or switch on an Ethernet segment

Downloaded from www.Manualslib.com manuals search engine

Dual Hubs

In this example, each NIC is connected to a separate hub to provide redundancy. If the hub port being used by the primary NIC fails, the backup NIC becomes active and all network traffic is immediately directed through it.

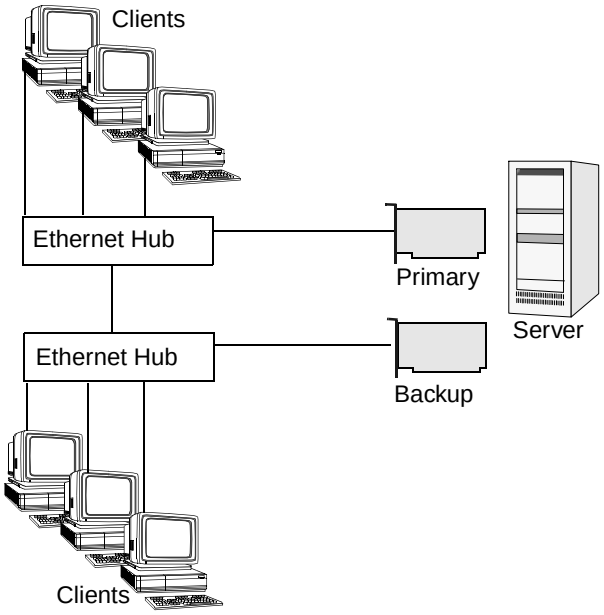

Figure 4-3. Two NICs connected to separate hubs

Downloaded from www.Manualslib.com manuals search engine

Dual Hubs with an Ethernet Switch

This example shows how Duralink64 Failover provides network redundancy to a switched network. Ethernet switches provide network traffic segmentation.

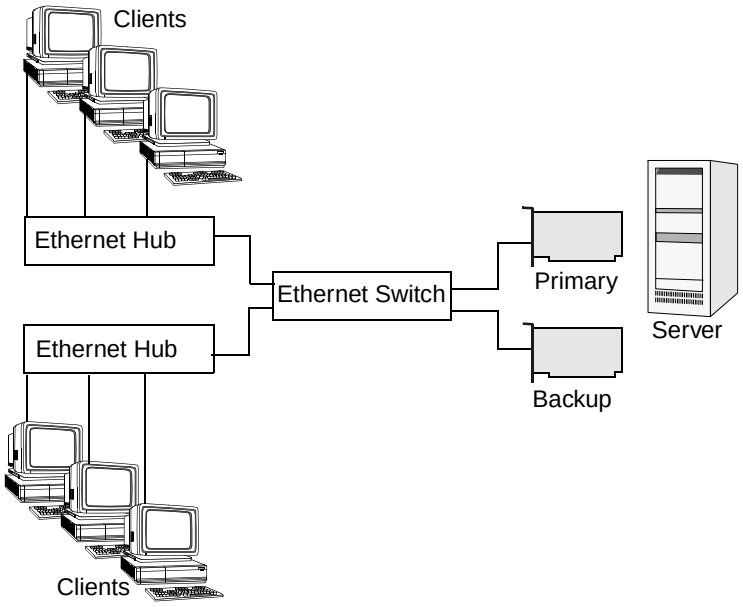

Figure 4-4. Duralink64 Failover on a network with dual hubs and an Ethernet switch

Downloaded from www.Manualslib.com manuals search engine

Dual Hubs with Routers

The following example shows how to set up Duralink64 Failover in a network configuration using routers. Routers provide WAN and LAN connectivity and allow physical network protocol redundancy.

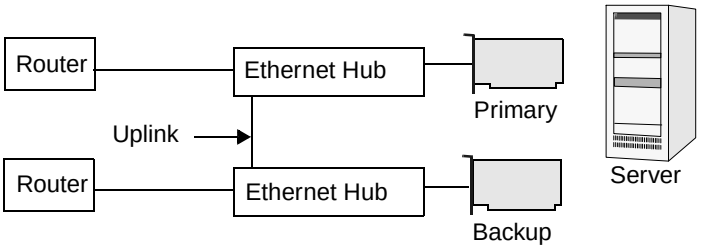

Figure 4-5. Duralink64 Failover in a network configuration using routers

Downloaded from www.Manualslib.com manuals search engine

Dual Hubs with a Four-Port NIC

This example shows port redundancy, using Duralink64 Failover, within a 4-port NIC. As shown in the illustration below, Ports 1 and 3 are used as the primary ports to each Ethernet hub. Ports 2 and 4 are backup ports connected to each hub.

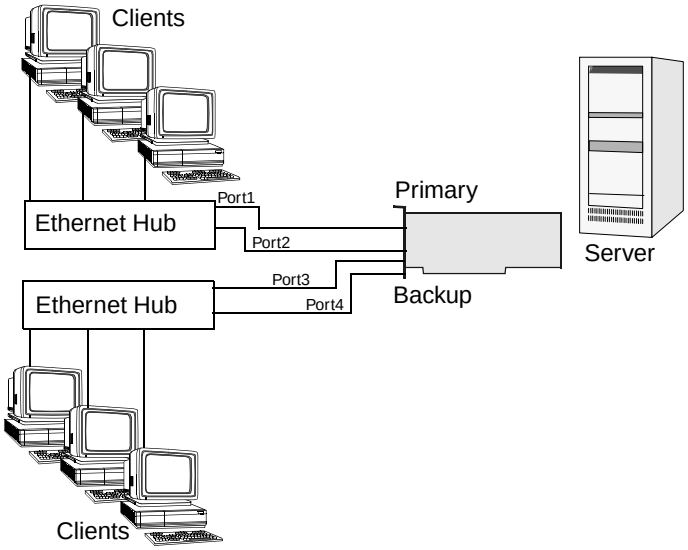

Figure 4-6. A 4-Port NIC provides port redundancy

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

▼▼▼▼ Part 3

The DuraLink64 Driver for Windows

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

5

Duralink64 Driver Installation for Windows

In This Chapter

Before You Begin	5-2
Note on DuraLAN NIC Ports	5-2
Installing the DuraLAN Driver	5-3
Installation Tips	5-11
Removing Previously Installed Drivers	5-13

This chapter provides instructions for installing the DuraLink64® driver of your choice on a server running Windows NT versions 4.0 and 3.51.

Downloaded from www.Manualslib.com manuals search engine

Before You Begin

- Verify that all system, memory, and NIC requirements are met, see *System Requirements* on page 1-2.
- Verify that the new Adaptec DuraLAN NIC is installed properly in the server, see Chapter 3, *DuraLAN NIC Installation*.
- Check your system for installed DuraLAN NIC drivers. If a DuraLAN Standard driver, Duralink64 Failover driver, or Duralink64 Port Aggregation driver exists, remove it! See *Removing Previously Installed Drivers* on page 5-13.

Caution: This procedure is critical. Only one DuraLAN driver may exist in a system!

Note on DuraLAN NIC Ports

When you are installing Adaptec DuraLAN NICs, it is a good idea to document where each port physically resides in the server, especially when two or more identical NICs exist. This is important because ports are identified by generic port names, such as Adptsf1, Adptsf2, Adptsf3, etc.

Port names are assigned to ports in the order that the system scans these ports at boot time. Consequently, whenever you physically rearrange the network cards, the port names change as well.

Downloaded from www.Manualslib.com manuals search engine

Installing the DuraLAN Driver

Windows NT 4.0

If you are installing Windows NT at this time, start with step 6 when prompted for the DuraLAN NIC.

To install the DuraLAN driver on a Windows NT 4.0 platform follow these steps:

1. Start Windows NT.
2. From the Start menu, point to **Settings**, and then click **Control Panel**.
3. In the Control Panel, double-click **Network**.
4. In the Network window, click the **Adapters** tab.
5. In the Adapters tab, click **Add**.
6. In the Select Network Adapter window, click **Have Disk**.

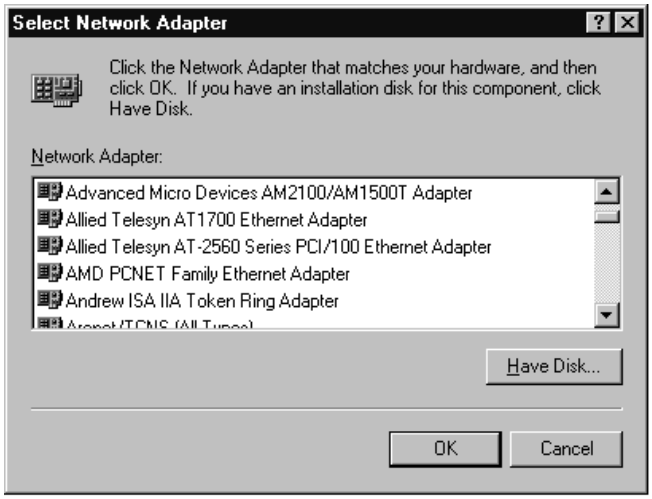
Select Network Adapter
Click the Network Adapter that matches your hardware, and then click OK. If you have an installation disk for this component, click Have Disk.
Network Adapter:
Advanced Micro Devices AM2100/AM1500T Adapter
Allied Telesyn AT1700 Ethernet Adapter
Allied Telesyn AT-2560 Series PCI/100 Ethernet Adapter
AMD PCNET Family Ethernet Adapter
Andrew ISA IIA Token Ring Adapter
Have Disk...
OK
Cancel

Figure 5-1. Select Network Adapter

Downloaded from www.Manualslib.com manuals search engine

7 At the Insert Disk window, insert the Duralink64 for Windows diskette, and then click **OK**.

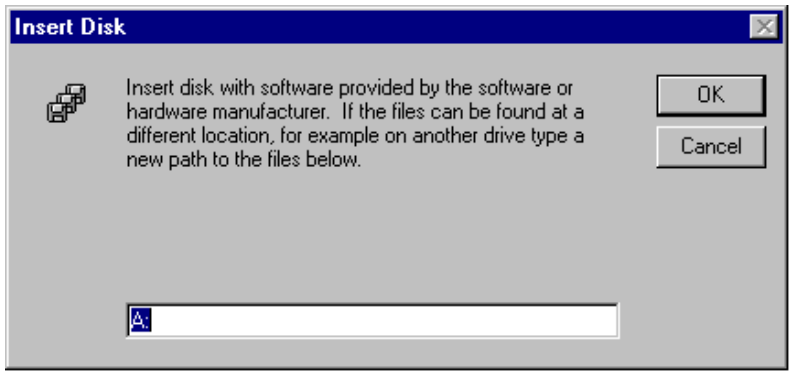
Insert Disk
Insert disk with software provided by the software or hardware manufacturer. If the files can be found at a different location, for example on another drive type a new path to the files below.
OK
Cancel
A:

Figure 5-2. Insert Disk Window

8 In the Select OEM Option window, click the DuraLAN NIC model that is installed and then click **OK**.

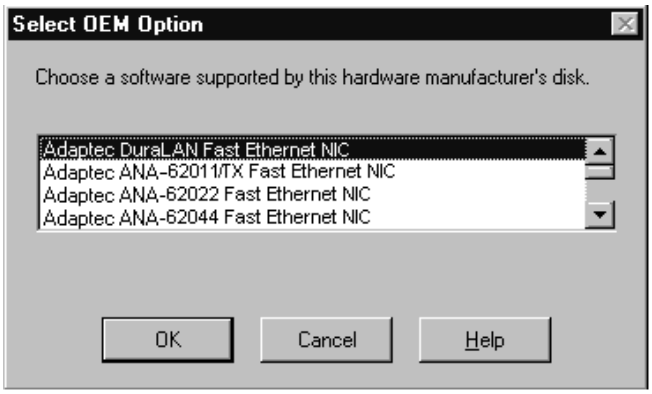

Figure 5-3. Select OEM Option Window

Downloaded from www.Manualslib.com manuals search engine

9 In the Adaptec DuraLAN NIC Driver Installation window, select the driver and then click **OK.**

Figure 5-4. Adaptec NIC Driver Installation Window

10 Continue to the appropriate configuration chapter:

- Chapter 6, *Duralink64 Standard Driver for Windows.*
- Chapter 7, *Duralink64 Failover for Windows NT.*
- Chapter 8, *Duralink64 Port Aggregation for Windows NT.*

Downloaded from www.Manualslib.com manuals search engine

Windows NT 3.51

If you are installing Windows NT at this time, start with step 6 when prompted for the DuraLAN NIC.

To install the DuraLAN driver on a Windows NT 3.51 platform, follow these steps:

1. Start Windows NT.
2. From the Main Group menu click **Control Panel**.
3. In the Control Panel, double-click **Network**.
4. In the Network Settings window, click **Add Adapters.**

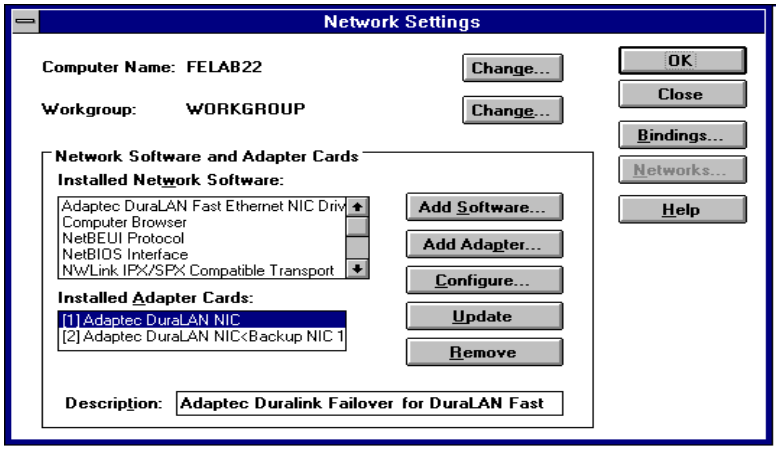

Figure 5-5. Network Settings Window

5. In the Add Network Adapter window, select **(Other) Requires disk from manufacturer**.

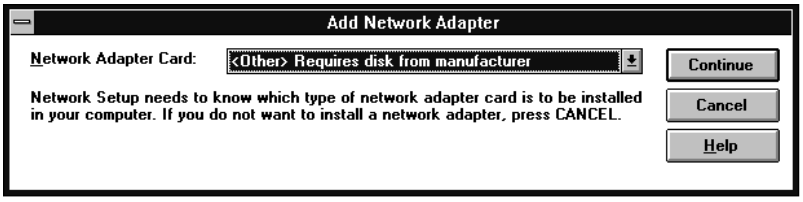
Add Network Adapter
Network Adapter Card:
<Other> Requires disk from manufacturer
Continue
Network Setup needs to know which type of network adapter card is to be installed in your computer. If you do not want to install a network adapter, press CANCEL.
Cancel
Help

Figure 5-6. Add Network Adapter

6. At the Insert Disk window, insert the Duralink64 for Windows diskette and then click **OK**.

Downloaded from www.Manualslib.com manuals search engine

7 In the Select OEM Option window, click the DuraLAN NIC model that is installed and then click **OK**.

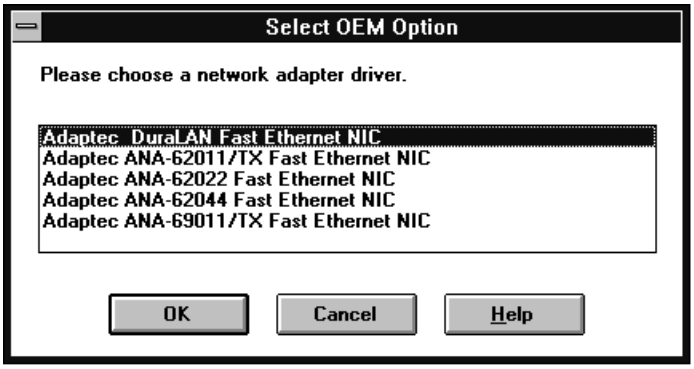

Figure 5-7. Select OEM Option Window

8 In the Adaptec DuraLAN NIC Driver Installation window, select the driver and then click **OK.**

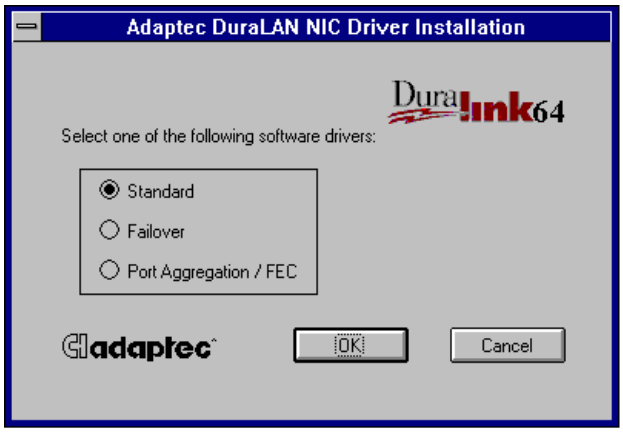

Figure 5-8. Adaptec DuraLAN Driver Installation

9 Continue to the appropriate configuration chapter:

- Chapter 6, *Duralink64 Standard Driver for Windows*.
- Chapter 7, *Duralink64 Failover for Windows NT*.
- Chapter 8, *Duralink64 Port Aggregation for Windows NT*.

Downloaded from www.Manualslib.com manuals search engine

Windows 98

To install the DuraLAN Driver on the Windows 98 platform, follow these steps:

1. Start Windows 98, and wait for the New Hardware window to open.[1]
2. In the first screen, click **Next**.
3. In the next window, click **Search for the best driver for your device. (Recommended)**, and then click **Next**.
4. In the next window, select **Floppy Disk Drives.**
5. Insert the Duralink64 for Windows Disk, and then click **Next**.

Note: If you do not insert the floppy disk, this message appears: Windows was unable to locate a driver for this device. If you do not want to install a driver now, click Next. To search again, click **Back**.

6. The system indicates that the driver file was found. Insert the CD you used to install Windows 98, and then click **Next**.

Note: You may receive the following Version Conflict message: A file being copied is older than the file currently on your computer. It is recommended that you keep your existing file. Do you want to keep the file? Click **Yes**.

7. Click **Finish**.
8. Remove the floppy disk.
9. If the System Settings Change window appears, click **Yes** to restart the system.
10. Continue to Chapter 6, *Duralink64 Standard Driver for Windows*.

[1] If the wizard does not open, refer to the *Installation Tips* on page 5-12.

Downloaded from www.Manualslib.com manuals search engine

Windows 95

This section provides instructions for installing the DuraLAN Standard driver in Windows 95 OSR1 and OSR2. To verify which version of Windows 95 is installed, see *Important Note for Windows 95 Users!* on page 3-2.

Windows 95 OSR2

To install the DuraLAN Standard driver on a Windows 95 OSR2 platform, follow these steps:

1. Start Windows 95. The Update Device Driver wizard opens.
2. Insert the Duralink64 for Windows diskette.
3. In the wizard, click **Next**.
4. Click **Finish**.
5. In the Insert Disk window, click **OK**.
6. Type **a:** and then click **OK**.
7. In the Insert Disk window, insert the Windows 95 CD, then click **OK**.
8. Enter the path to the Windows 95 installation directory, and then click **OK**. (For example **d:\win95**.[1] Consult your Microsoft Windows 95 documentation for help.)
9. Remove the floppy disk from the floppy drive.
10. At the System Settings Change window, restart the system.
11. Optional. To verify the driver installation, see *Installation Tips* starting on page 5-11.

Note: As the system restarts, Windows 95 applies the driver files to each additional port detected.

12. Continue to Chapter 6, *Duralink64 Standard Driver for Windows*.

[1] In this example, d:\ represents the CD-ROM drive letter.

Downloaded from www.Manualslib.com manuals search engine

Windows 95 OSR1

To install the DuraLAN Standard Driver Windows 95 OSR1 platform, follow these steps:

1. Start Windows 95. The New Hardware Found wizard opens.
2. In the wizard, click **Driver from disk provided by hardware manufacturer**, and then click **OK**.
3. Insert the Duralink64 for Windows Disk.
4. In the Install from Disk window, type **a:\win95a** and then click **OK**.

Caution: If you accept the default path, **a:**, the system will copy the wrong files which will cause errors in Windows 95 OSR1 version.

5. In the Copying Files... window, insert the Windows 95 CD, and then click **OK**.
6. Enter the path to the Windows 95 directory, and then click **OK**. (For example, **d:\win95**.[1] Consult your Microsoft Windows 95 documentation for help.)
7. Remove the floppy disk from the floppy disk drive.
8. If the System Setting Change window appears, click **Yes** to restart the system.

Note: As the system restarts, Windows 95 applies the driver files to each additional port detected.

9. Optional. To verify the driver installation, see *Installation Tips* starting on page 5-11.
10. Continue to Chapter 6, *Duralink64 Standard Driver for Windows*.

[1] In this example, d:\ represents the CD-ROM drive letter.

Downloaded from www.Manualslib.com manuals search engine

Installation Tips

This section provides tips to assist you in the DuraLAN driver installation.

Windows 95

How do I verify that the DuraLAN Standard driver is installed properly?

1. From the Start menu, point to **Settings**, then click **Control Panel**.
2. In the Control Panel, double-click **System**.
3. In the Device Manager tab, look under Network adapters.

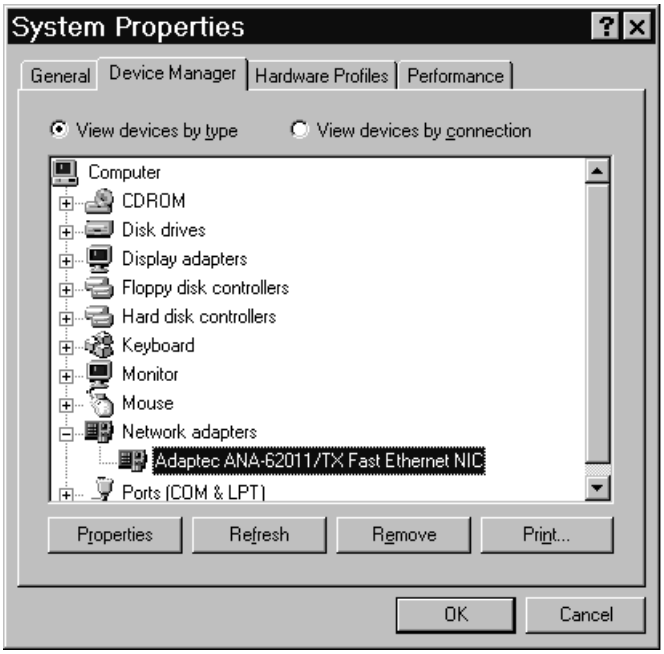

Figure 5-9. The DuraLAN NIC appears under Network adapters

4. The DuraLAN NIC appears under Network Adapters. Click **OK**.

Downloaded from www.Manualslib.com manuals search engine

A yellow exclamation ! appears beside the DuraLAN NIC. What should I do?

Remove the current DuraLAN Standard driver and then reinstall it. See *Windows 98 and 95 OSR1/OSR2* on page 5-14.

In the Device Manager, the new NICs replace the older NICs, but the Network window lists both. What should I do?

Remove the older NIC(s).

1. In the Network window, click the old NIC and then click **Remove**. Repeat this step for each appropriate NIC.
2. Click **OK** when you are done.

Windows 98

How do I access the Add New Hardware wizard if it does not open?

1. Click the **Start** menu, point to Settings, and then click the **Control Panel**.
2. In the Control Panel, double-click **Add New Hardware**.

Windows Clients Using Novell Client32

Connecting clients to the NetWare Duralink64 server requires the NDIS driver. *Do not* use an ODI driver! See *Installing Duralink64 NetWare Client* on page 12-1.

Downloaded from www.Manualslib.com manuals search engine

Removing Previously Installed Drivers

This section provides instructions for removing the previously installed DuraLAN Standard driver which is necessary if you are installing the new Duralink64 driver included with your DuraLAN NIC.

Windows NT 4.0

To remove the previously installed DuraLAN driver from a Windows NT 4.0 platform, follow these steps:

1. Double-click **My Computer**.
2. Double-click **Control Panel**.
3. Double-click **Network**.
4. In the Network window, click the **Adapters** tab.
5. In the Network Adapters list, click the Adaptec DuraLAN NIC you want to remove, and then click **Remove**.
6. When asked if you wish to continue, click **Yes**.
7. Repeat step 5 until all Adaptec DuraLAN drivers are removed.
8. When you are done, click **OK**.
9. Click **Close** to close the Network window.
10. Click **Yes** to restart your computer.

Note: When you restart Windows NT, a message may indicate that at least one service failed to start. This message will not appear after you add the new driver. Click **OK**.

Downloaded from www.Manualslib.com manuals search engine

Windows NT 3.51

To remove the previously installed Duralink64 driver from the Windows NT 3.51 platform, follow these steps:

1. In the Main window, double-click **Control Panel**.
2. In the Control Panel, double-click **Network** to enter the Network Settings window.
3. In the Installed Adapters Cards box, click the DuraLAN NIC, and then click **Remove**.
4. Repeat step 3 until all DuraLAN NICs have been removed.
5. Click **OK** when you are done.
6. Restart the system.

Windows 98 and 95 OSR1/OSR2

To remove the previously installed DuraLAN driver from the Windows 98 and Windows 95 OSR1/OSR2 platform, follow these steps:

1. From the Start menu, point to **Settings**, and then click **Control Panel**.
2. In the Control Panel, double-click **System**.
3. Select the Device Manager tab, then click **Network Adapters**.
4. Select Adaptec DuraLAN NIC to remove, then click **Remove**.
5. Repeat steps 3 and 4 for each existing DuraLAN NIC.
6. Restart the system.

❒

Downloaded from www.Manualslib.com manuals search engine

6

Duralink64 Standard Driver for Windows

In This Chapter

Configuring the Standard Driver Ports in Windows NT 4.0 and 3.51	6-2
Configuring the Ports in Windows 98/95	6-4

This chapter describes how to configure the DuraLAN Standard driver for Windows.

Downloaded from www.Manualslib.com manuals search engine

Configuring the Standard Driver Ports in Windows NT 4.0 and 3.51

In the Adaptec New Hardware Found window, each port is assigned to Autodetect, the default connection type that will always detect port connection and negotiate a compatible speed and transmission mode.

Note: If you are required to insert the Windows NT CD, you must re-install the latest version of the Microsoft Windows NT Service Pack, and then restart the system.

1 In the Adaptec New Hardware Found window, make sure all the DuraLAN NIC ports appear.

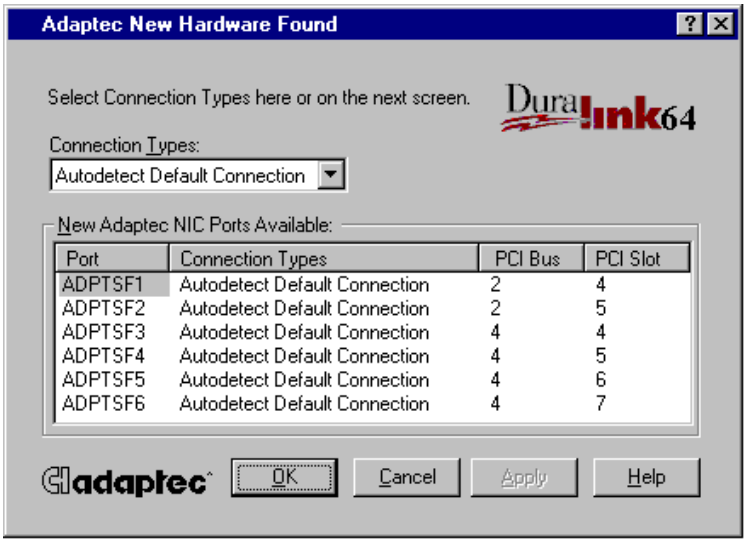

Figure 6-1. This window identifies each port's PCI bus and PCI slot

2 In the New Adaptec NIC Port(s) Available for DuraLAN NIC box, click the appropriate port.

3 In the Connection Types list, click the connection type for your network or use **Autodetect Default Connection**. For descriptions, see *Connection Types* on page A-2.

Downloaded from www.Manualslib.com manuals search engine

4. Click **Apply**.
5. Repeat steps 1 through 4 for each existing port.
6. When you are done, click **OK**.
7. When you are done, click **Close** in the Network window.
8. Restart the system.

Downloaded from www.Manualslib.com manuals search engine

Configuring the Ports in Windows 98/95

To configure ports in Window 98 and Windows 95 OSR2 or OSR1, follow these steps:

1. From the Start menu, point to **Settings**, and then click **Control Panel**.
2. In the Control Panel, double-click **Network**.
3. In the Network window, click the appropriate DuraLAN NIC, and then click **Properties**.

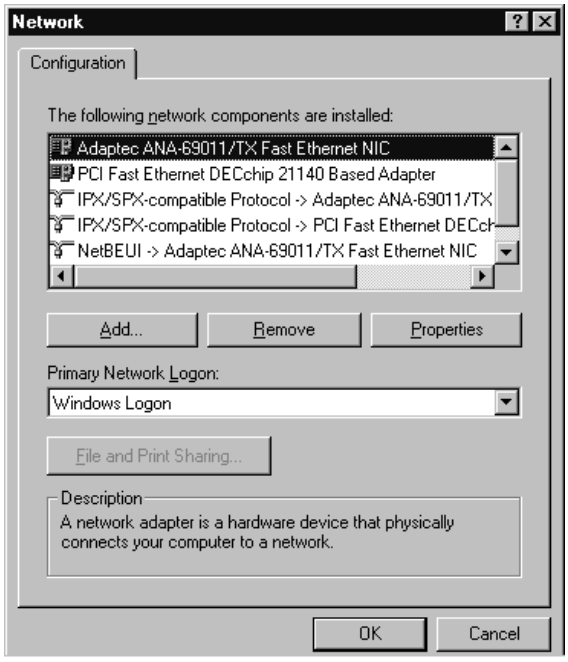

Figure 6-2. Windows 95 Configuration Tab

4. In the Properties window, click the **Advanced** tab.
5. In the Property box, click **Connection Type**.

Downloaded from www.Manualslib.com manuals search engine

6 In the Value list, click the appropriate connection type. (*Connection Types* on page A-2 provides descriptions.)

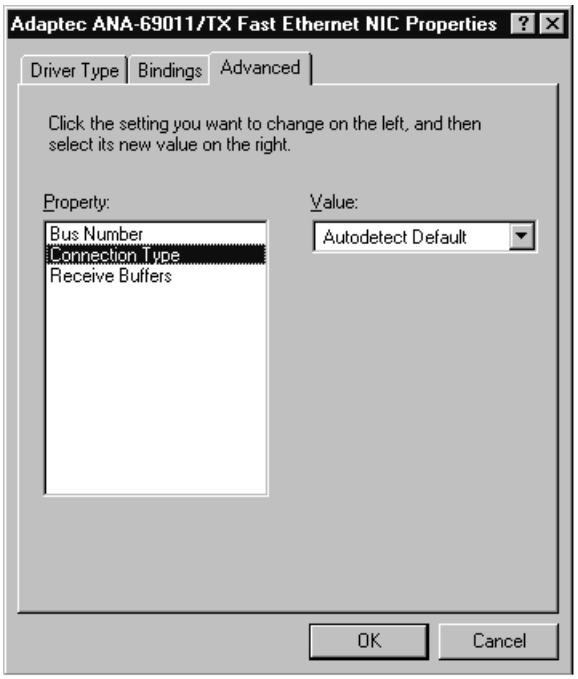

Figure 6-3. Advanced Tab

7 Click **OK**.

8 In the Configuration tab, click **OK**.

9 Restart your system.

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

▼▼▼▼ 7

Duralink64 Failover for Windows NT

In This Chapter

Configuring the Ports	7-2
Creating the Failover Pair	7-3
Monitoring Failover Pairs	7-8
Note on DuraLAN NIC Ports	7-8

This chapter provides instructions for installing Duralink64 Failover on a server running Windows NT versions 4.0 and 3.51.

Downloaded from www.Manualslib.com manuals search engine

Configuring the Ports

In the Adaptec New Hardware Found window, each port is assigned to Autodetect, the default connection type that will always detect port connection and negotiate a compatible speed and transmission mode.

1 In the Adaptec New Hardware Found window, make sure all the DuraLAN NIC ports appear.

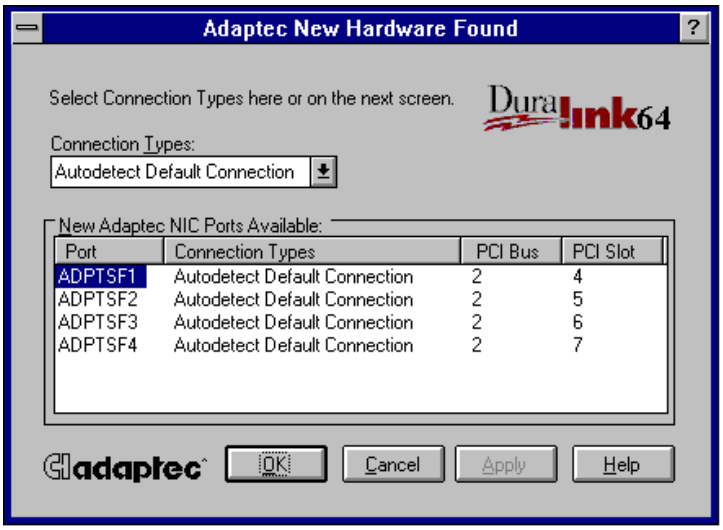

Figure 7-1. This window identifies each port's PCI bus and PCI slot

Note: Generally, PCI Bus 0 is the PCI Bus on the motherboard. PCI Bus 1 or above is an ANA-62022 or ANA-62044 NIC. The PCI Slot represents the port on the NIC starting from the top. The top port starts at PCI Slot 4.

2 In the New Adaptec NIC Ports Available box, click the appropriate port.

3 In the Connection Types list, click the connection type for your network or use **Autodetect Default Connection**. For descriptions, see *Connection Types* on page A-2.

4 Click **Apply**.

Downloaded from www.Manualslib.com manuals search engine

5 Repeat steps 1 through 4 for each existing port.

6 When you are done, click **OK**.

7 Continue with *Creating the Failover Pair*.

Creating the Failover Pair

You can create Failover pairs in the Configuration tab. A Failover pair consists of two ports only—the primary port and the backup port.

Windows NT 4.0

To create Failover pairs, follow these steps:

1 From the Available Adaptec Ports box, click a port to be designated as a primary port.

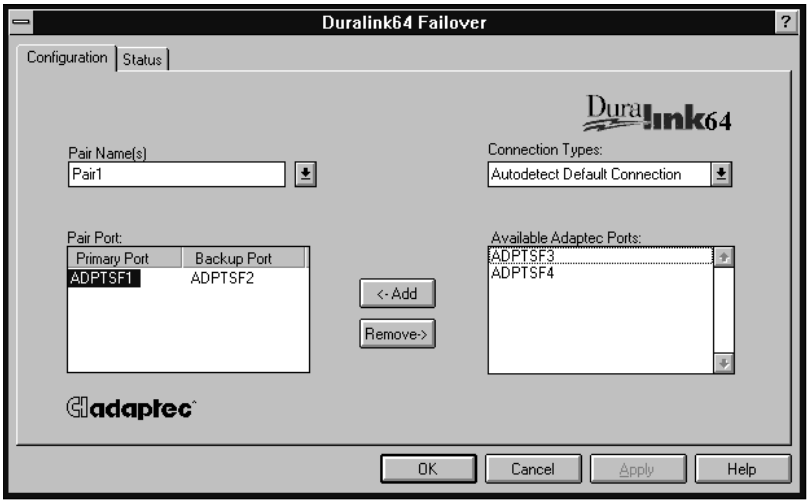

Figure 7-2. Failover Configuration Tab

2 Click **Add**. The port is added under Primary Port in the Failover Pair list.

3 To assign a backup to the primary port, click the appropriate port from the Available Adaptec Ports box, and then click **Add**. The port is added in the Backup Port field.

Downloaded from www.Manualslib.com manuals search engine

4 Click **Apply**.

5 **OPTIONAL**. Repeat steps 1 through 5 to create another Failover pair.

6 **OPTIONAL**. To remove a Failover pair:

a Click the port from the Primary Ports list, and then click **Remove**. Both ports return to the Available Adaptec Ports box.

b Click **Apply**.

7 When you are done, click **OK**. you will return to the Adapters tab.

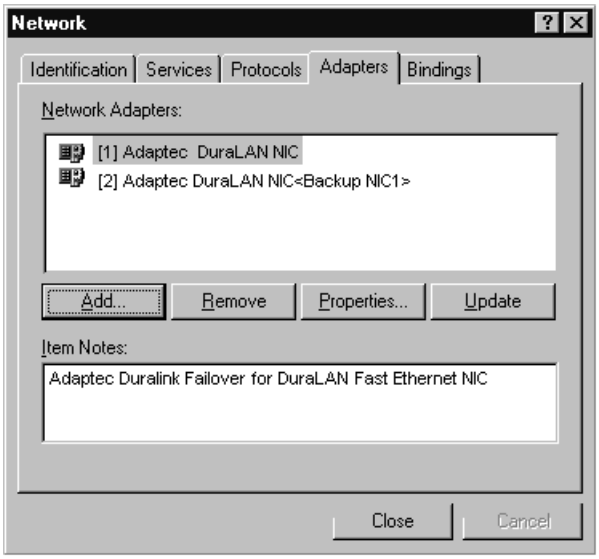

Figure 7-3. <Backup NIC1> indicates that Port 2 is the backup port for Port 1

Note: The Adapters tab identifies one model only, even when several DuraLAN NIC models are installed. The DuraLAN NIC model displayed is the same as the first model you chose in step 8 during the driver installation.

Downloaded from www.Manualslib.com manuals search engine

8 If SNMP is not set up, you will receive the Setup Message below. Click **OK**.

Setup Message
SNMP Service is not installed. To activate SNMP and Adaptec network management features on this system, install the NT SNMP Service. On the network management station, use the configure option to configure Server related MIBs.
OK

Figure 7-4. This message may be ignored during this installation.

9 Enter the protocol information. Consult your Microsoft Windows NT 4.0 documentation for help configuring the protocol.

10 When you are done, remove the floppy disk from the floppy drive.

11 Restart the system.

Note: If you were required to insert the Windows NT CD, you must re-install the latest version of Microsoft Windows NT Service Pack, and then restart the system.

Downloaded from www.Manualslib.com manuals search engine

Windows NT 3.51

To create Failover pairs, follow these steps:

1. From the Available Adaptec Ports box, click the port you want as the primary port.

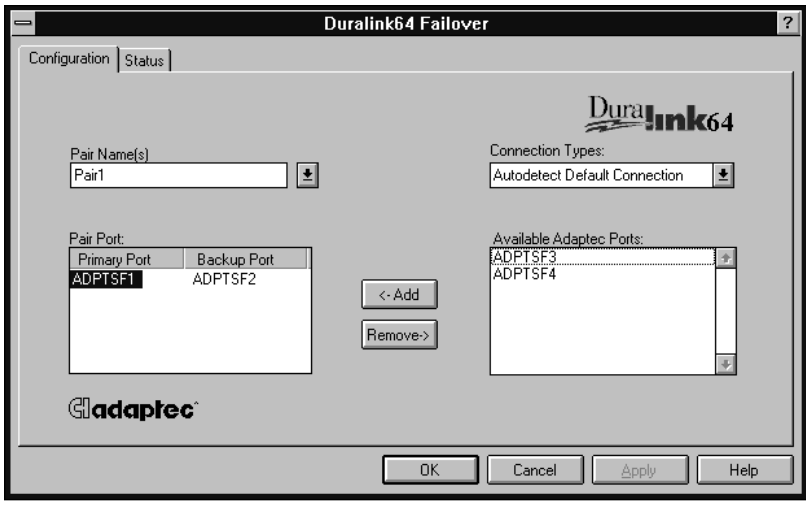

Figure 7-5. Configuration Tab

2. Click **Add**. The port is added under Primary Port in the Failover Pair list.
3. To assign a backup to the primary port, click the appropriate port from the Available Adaptec Ports box, and then click **Add**. The port is added in the Backup Port field.
4. Click **Apply**.
5. **OPTIONAL**. Repeat steps 1 through 5 to create another Failover pair.
6. **OPTIONAL**. To remove a Failover pair
   a. Click the port from the Primary Ports list, and then click **Remove**. Both ports return to the Available Adaptec Ports box.
   b. Click **Apply**.

Downloaded from www.Manualslib.com manuals search engine

7 When you are done, click **OK**. you will return to the Network Settings Window.

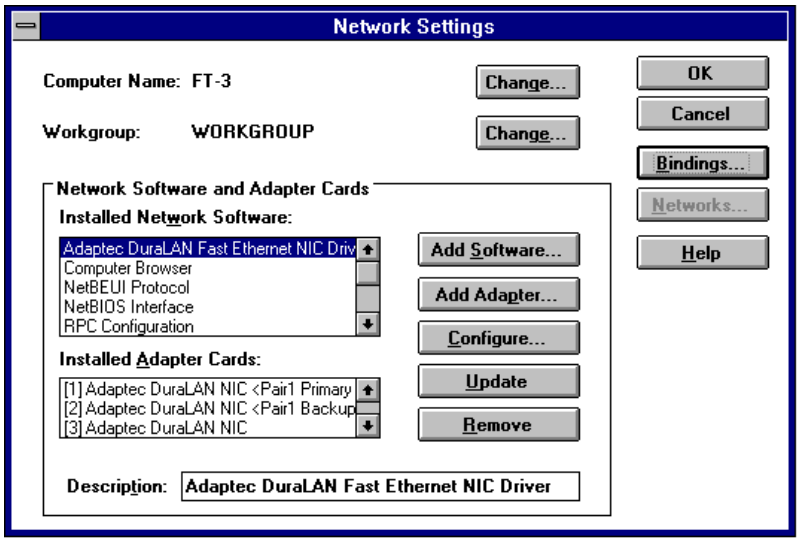

Figure 7-6. Network Setting Window

8 Click **OK**.

Note: The Adapters tab identifies one model only, even when several DuraLAN NIC models are installed. The DuraLAN NIC model displayed is the same as the first model you chose in step 8 during the driver installation.

9 If SNMP is not set up, you will receive the Setup Message below. Click **OK**.

Setup Message
SNMP Service is not installed. To activate SNMP and Adaptec network management features on this system, install the NT SNMP Service. On the network management station, use the configure option to configure Server related MIBs.
OK

Figure 7-7. This message may be ignored during this installation.

Downloaded from www.Manualslib.com manuals search engine

10 Consult your Microsoft Windows NT 3.51 documentation for help configuring the protocol (such as entering values for TCP/IP).

11 When you are done, remove the floppy disk from the floppy disk drive.

12 In the Network Setting Change window, click **Restart Now**.

Note: If you were required to insert the Windows NT CD, you must re-install the latest Microsoft Windows NT Service Pack, and then restart the system again.

Monitoring Failover Pairs

There are three ways to monitor the status of the Failover Pairs:

- SNMP Manager—when failover occurs SNMP traps are sent to network management stations and error logs are updated through the operating system event log. In order to manage SNMP agents, compile the following MIB file on the SNMP management station:

  a:\snmpmibs\duralink.mib

- Event Viewer Dialog Box—the local Event Viewer dialog box will log port failures in Windows NT.
- Duralink64 Failover window —the Status tab monitors the traffic and health of the failover pairs.

Note on DuraLAN NIC Ports

When you are installing Adaptec DuraLAN NICs, it's a good idea to document where each port physically resides in the server, especially when two or more identical NICs exist. This is important because ports are identified by generic port names, such as Adptsf1, Adptsf2, Adptsf3, etc.

Port names are assigned to ports in the order that the system scans these ports at boot time. Consequently, whenever you physically rearrange the network cards, the port names change as well.

❒

Downloaded from www.Manualslib.com manuals search engine

8

Duralink64 Port Aggregation for Windows NT

In This Chapter

Configuring the Ports	8-2
Creating Port Aggregation Groups	8-4
Creating Fast EtherChannel Groups	8-8
Assigning the TCP/IP Address	8-11
Modifying Groups	8-13
Checking System Status	8-17
Windows NT Performance Monitor	8-20

This chapter provides instructions for configuring Duralink64 Port Aggregation on a server running Windows NT.

Downloaded from www.Manualslib.com manuals search engine

Configuring the Ports

In the Adaptec New Hardware Found window, each port is assigned to Autodetect, the default connection type that will always detect port connection and negotiate a compatible speed and transmission mode.

1 In the Adaptec New Hardware Found window, make sure all the DuraLAN NIC ports appear.

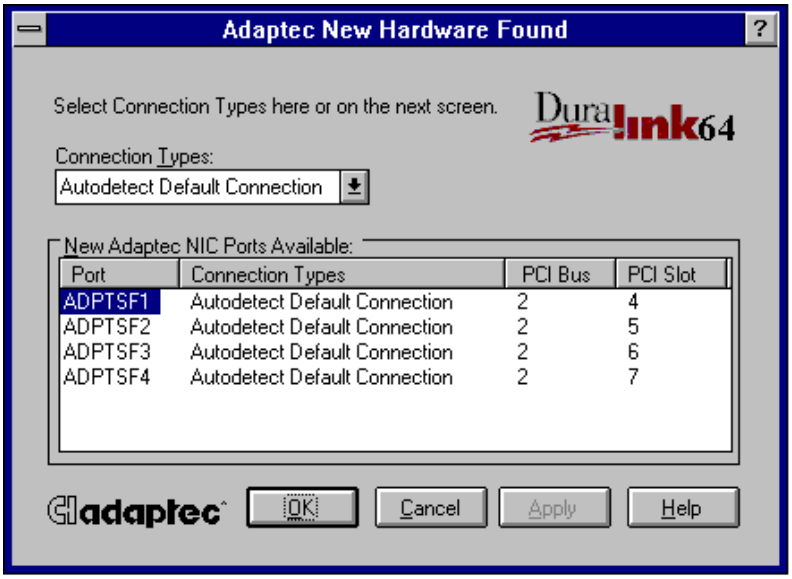

Figure 8-1. This window identifies each port's PCI bus and PCI slot

Note: Generally, PCI Bus 0 is the PCI Bus on the motherboard. PCI Bus 1 or above is an ANA-62022 or ANA-62044 NIC. The PCI Slot represents the port on the NIC starting from the top. The top port starts at PCI Slot 4.

2 In the New Available NIC Ports Available box, click the appropriate port.

Downloaded from www.Manualslib.com manuals search engine

3. In the Connection Types list, click the connection type for your network or use **Autodetect Default Connection**. For descriptions, see *Connection Types* on page A-2.
4. Click **Apply**.
5. Repeat steps 1 through 4 for each existing port.
6. When you are done, click **OK**.
7. Continue to *Creating Port Aggregation Groups.*

Downloaded from www.Manualslib.com manuals search engine

Creating Port Aggregation Groups

This section explains how to assign ports to a group, thus, creating a virtual port. If you have installed Duralink64 Port Aggregation already and wish to add or modify existing group or stand-alone port configurations, see *Modifying Groups* on page 8-13.

1 In the Group(s) field, click **Create New Group**, and then type the new group name.

Note: The group name may be up to 20 characters. If you skip this step, the system assigns a default group name (GroupX).

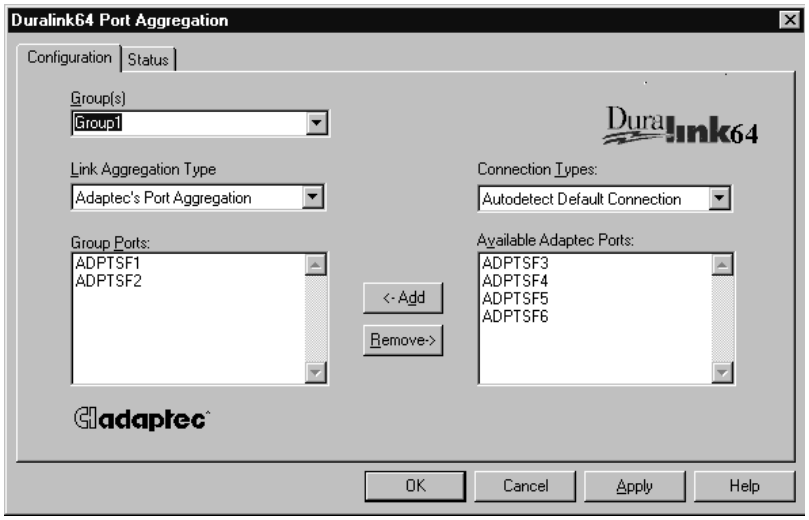

Figure 8-2. Duralink64 Port Aggregation Configuration Tab

2 In the Link Aggregation Type field, click the appropriate link type. For a description of Adaptec's Port Aggregation, see Chapter 2, *Introduction to Duralink64 Port Aggregation*.

Note on Cisco's Fast EtherChannel. This option allows you to fully aggregate two or four ports over transmit and receive under all protocols. The ports that are configured as the Fast EtherChannel group must be physically connected to the Fast EtherChannel ports on the Cisco switch. See your

Downloaded from www.Manualslib.com manuals search engine

Cisco switch documentation to configure the ports in Fast EtherChannel mode.

If you select Fast EtherChannel on the server, the connection type for each port is automatically configured to 100 Mbps TX/Full Duplex. You must also configure the ports on the Cisco switch (used by the Fast EtherChannel group) to either **Auto Negotiation** or **100 Mbps/Full Duplex** mode.

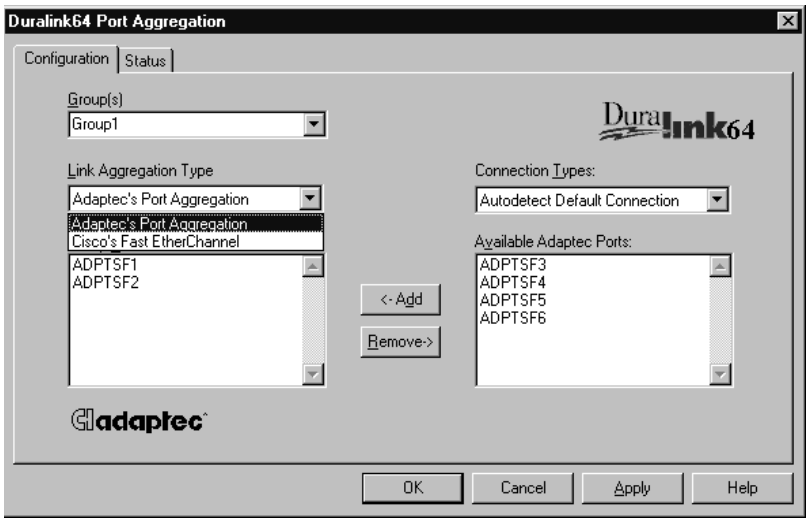

Figure 8-3. The Link Aggregation Type Options

Downloaded from www.Manualslib.com manuals search engine

3 In the Available Adaptec Ports box, click the available port to add to the group, and then click **Add**.

4 Repeat step 3 for each additional port.

Note: You must assign the same connection type to each port in the same group.

OPTIONAL. To remove a port from the group, click the appropriate port from the Group Ports box, and then click **Remove**.

5 When you are finished configuring the group, click **Apply**.

6 To create another group, repeat steps 1 through 5.

7 If you want to rename a group:

a Select the default group name in the Group(s) list box.

b Type the new name.

c Click **Apply**.

8 When you are finished configuring all groups, click **OK**.

9 If SNMP is not set up on the computer, you will receive the message below. Click **OK**.

Setup Message
SNMP Service is not installed. To activate SNMP and Adaptec network management features on this system, install the NT SNMP Service. On the network management station, use the configure option to configure Server related MIBs.
OK

Figure 8-4. This message may be ignored during this installation.

Downloaded from www.Manualslib.com manuals search engine

10 In the Network window, click **Close**.

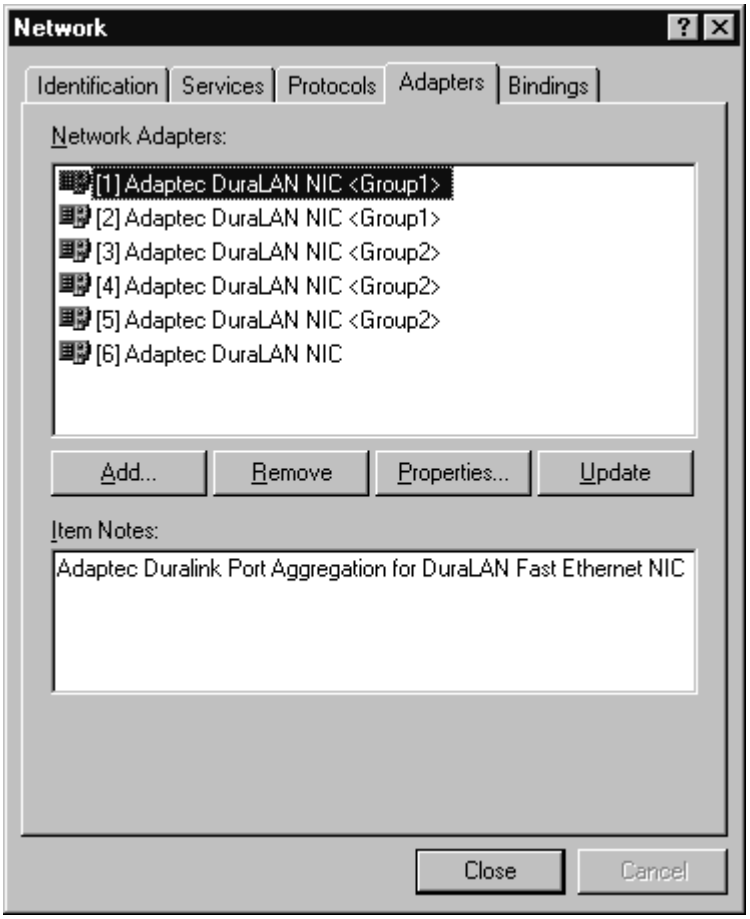

Figure 8-5. Ports and Groups Listed in Adapters Tab

11 Continue to *Assigning the TCP/IP Address* on page 8-11.

Downloaded from www.Manualslib.com manuals search engine

Creating Fast EtherChannel Groups

Fast EtherChannel (FEC) allows you to fully aggregate two or four ports over transmit and receive under all protocols. The ports that are configured as the FEC group must be physically connected to the FEC ports on the Cisco switch. See your Cisco switch documentation to configure the ports in FEC mode.

If you select Fast EtherChannel on the server, the connection type for each port is automatically configured to 100 Mbps TX / Full Duplex. You must also configure the ports on the Cisco switch (used by the FEC group) to either Auto Negotiation or 100 Mbps / Full Duplex mode

This section explains how to assign ports to a Fast EtherChannel group, thus, creating a virtual port. If you have installed Duralink64 Port Aggregation / FEC already and wish to add or modify existing group or stand-alone port configurations, see *Modifying Groups* on page 8-13.

1 In the Group(s) field, click **Create New Group**, and then type the new group name.

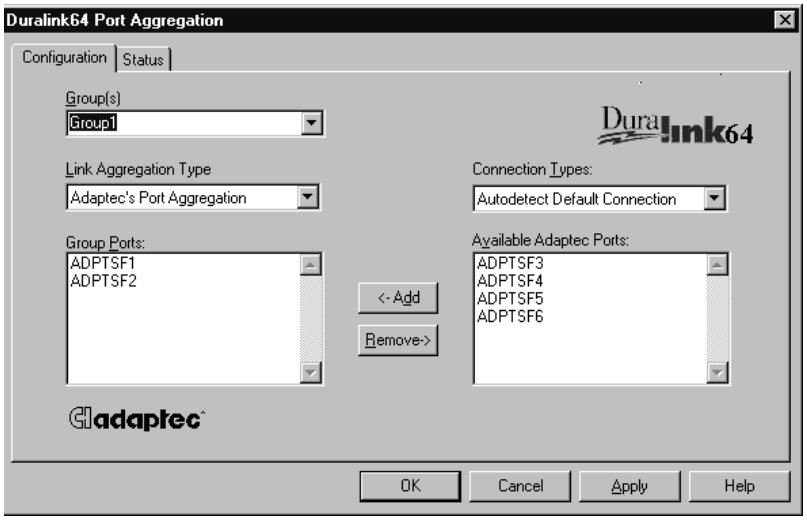

Figure 8-6. Duralink64 Port Aggregation Configuration Tab

Downloaded from www.Manualslib.com manuals search engine

Note: The group name may be up to 20 characters. If you skip this step, the system assigns a default group name (GroupX).

2 In the Link Aggregation Type field, click the appropriate link type. For a description of Adaptec's Port Aggregation, see Chapter 2, *Introduction to Duralink64 Port Aggregation*.

3 In the Available Adaptec Ports box, click the available port to add to the group, and then click **Add**.

4 Repeat step 3 for each additional port.

Note: You must assign the same connection type to each port in the same group.

OPTIONAL. To remove a port from the group, click the appropriate port from the Group Ports box, then click **Remove**.

5 When you are finished configuring the group, click **Apply**.

6 To create another group, repeat steps 1 through 5.

7 If you want to rename a group:

a Select the default group name in the Group(s) list box.

b Type the new name.

c Click **Apply**.

8 When you are finished configuring all groups, click **OK**.

9 If SNMP is not set up, you will receive the Setup Message below. Click **OK**.

Setup Message
SNMP Service is not installed. To activate SNMP and Adaptec network management features on this system, install the NT SNMP Service. On the network management station, use the configure option to configure Server related MIBs.
OK

Figure 8-7. This message may be ignored during this installation

Downloaded from www.Manualslib.com manuals search engine

10 In the Network window, click **Close**.

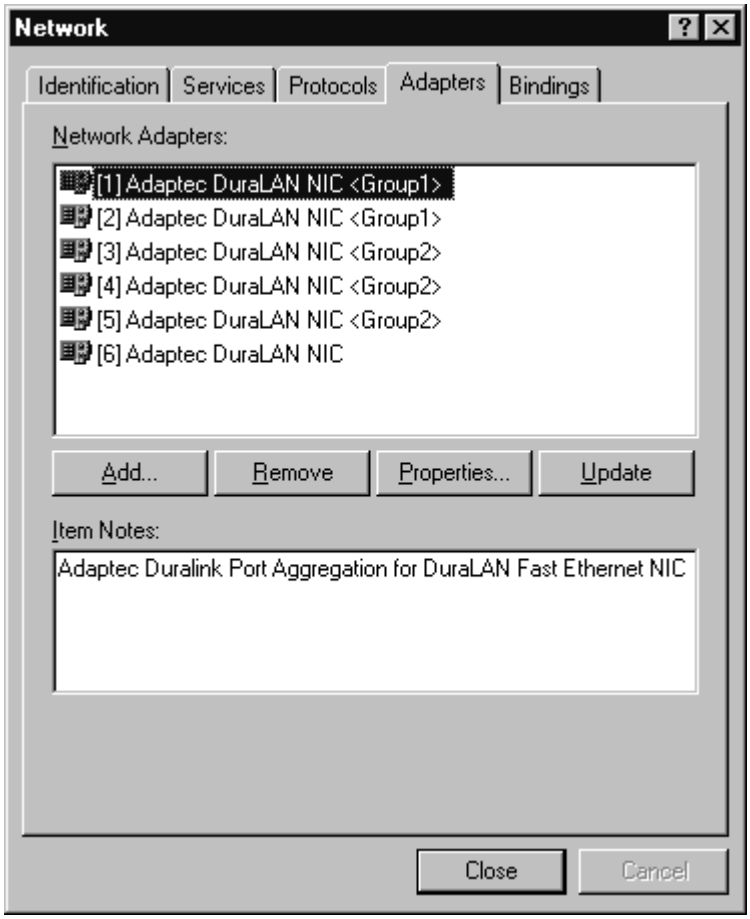

Figure 8-8. Ports and Groups Listed in Adapters Tab.

11 Continue to *Assigning the TCP/IP Address* on page 8-11.

Downloaded from www.Manualslib.com manuals search engine

Assigning the TCP/IP Address

Note: If you are an Windows NT 3.51 user, please refer to the Windows NT 3.51 documentation for help configuring protocols.

Once you have configured Duralink64 Port Aggregation, Windows NT prompts you to configure the protocol. IP addresses to groups and stand-alone ports are assigned in the IP Address tab, such as shown in the following figure. Ports assigned to a group use the same IP address; therefore, it must be entered only once.

To assign a TCP/IP Address follow these steps.

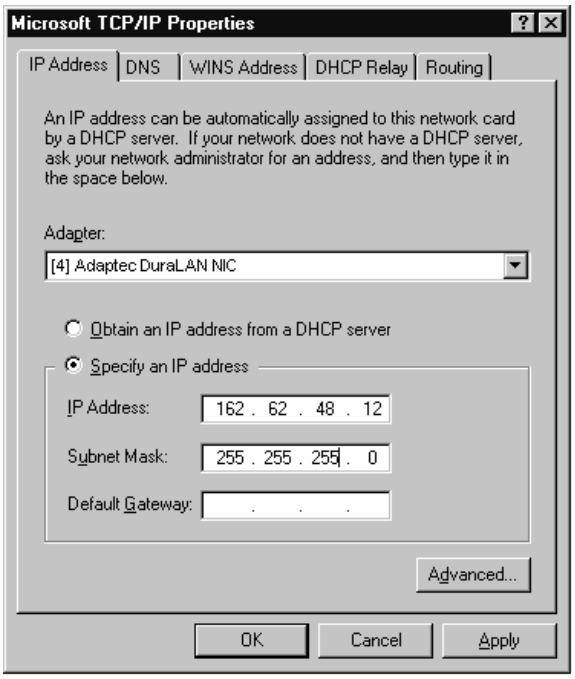
Microsoft TCP/IP Properties
IP Address
DNS
WINS Address
DHCP Relay
Routing
An IP address can be automatically assigned to this network card by a DHCP server. If your network does not have a DHCP server, ask your network administrator for an address, and then type it in the space below.
Adapter:
[4] Adaptec DuraLAN NIC
Obtain an IP address from a DHCP server
Specify an IP address
IP Address:
162 . 62 . 48 . 12
Subnet Mask:
255 . 255 . 255 . 0
Default Gateway:
Advanced...
OK
Cancel
Apply

Figure 8-9. IP Address Tab

1. In the IP Address tab, click the DuraLAN NIC port from the Adapter list.
2. In the IP Address field, type the IP address.

Downloaded from www.Manualslib.com manuals search engine

3. In the Subnet Mask field, type the subnet mask number.
4. Click **Apply**.
5. Repeat steps 1 through 4 for any other port or group.
6. Click **OK** when you are finished configuring all groups.
7. Restart your computer to complete the changes.
8. Click **Yes** at the message prompt to restart your computer.
9. Continue to *Checking System Status* on page 8-17.

Once Duralink64 Port Aggregation is installed, you may update group and port configurations using the instructions in the *Modifying Groups* section.

Downloaded from www.Manualslib.com manuals search engine

Modifying Groups

This section provides instructions for modifying the group or port configurations. You may rename groups, as well as add or remove ports from existing groups.

Renaming Groups

1. In the Duralink64 Port Aggregation window, go to the Configuration tab.

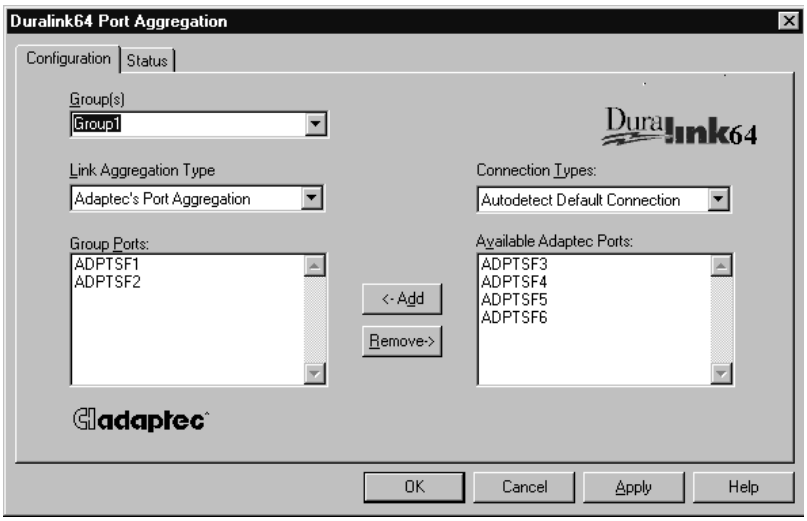

Figure 8-10. Modified groups in the Configuration tab

2. From the Group(s) field, select the appropriate group, and then type the new name.
3. Click **Apply**.

Downloaded from www.Manualslib.com manuals search engine

Adding or Removing Ports

Note: If you add or remove a port to or from a group, any existing group or port IP address is removed automatically. Keep track of any IP addresses you plan to use again.

1. In the Duralink64 Port Aggregation window, go to the Configuration tab.
2. In the Group(s) field, click **Create New Group**, and then type the new group name, or select the appropriate group you want to modify.
   - To add ports to the group, click the appropriate port from the Available Adaptec Ports box, and then click **Add**.
   - To remove ports from the group, click the appropriate port from the Group Ports box, and then click **Remove**.
3. Repeat step 2 for each appropriate port.
4. To save changes, click **Apply**.
5. When you are finished, click **OK**.
6. If SNMP is not set up on the computer, you will receive the message below. Click **OK**.

Setup Message
SNMP Service is not installed. To activate SNMP and Adaptec network management features on this system, install the NT SNMP Service. On the network management station, use the configure option to configure Server related MIBs.
OK

Figure 8-11. This message may be ignored during this installation.

Downloaded from www.Manualslib.com manuals search engine

7 When adding or deleting a group or port, you will receive a message such as shown below. Click **OK**.

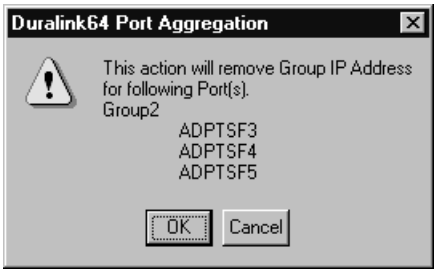

Figure 8-12. This message appears when you add ports with IP Addresses to a new group.

Figure 8-13. This message appears when you add ports with IP Addresses to Group2 with an existing IP Address.

Downloaded from www.Manualslib.com manuals search engine

8 In the Network window, click **Close**.

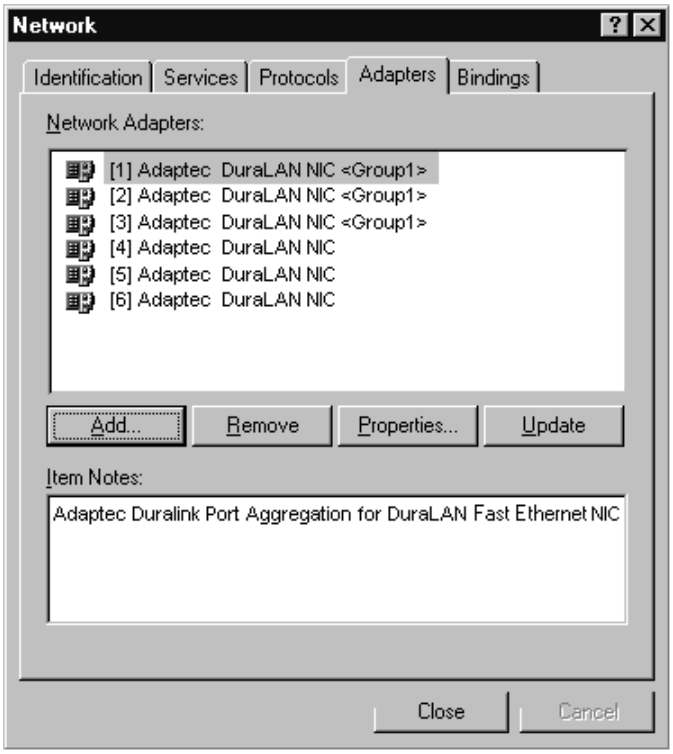

Figure 8-14. Ports and Groups Listed in Adapters Tab

Downloaded from www.Manualslib.com manuals search engine

Checking System Status

You can view group and independent port status. See *Field Descriptions* on page 8-18 for details.

1. From the Start menu, point to **Settings**, and then click **Control Panel**.
2. In the Control Panel, double-click **Network**.
3. In the Network window, click the **Adapters** tab.
4. In the Adapters tab, select the Adaptec DuraLAN NIC. The Duralink64 Port Aggregation window appears.
5. Click **Properties**.
6. Click the **Status** tab to view the group and independent port information, such as shown in below.

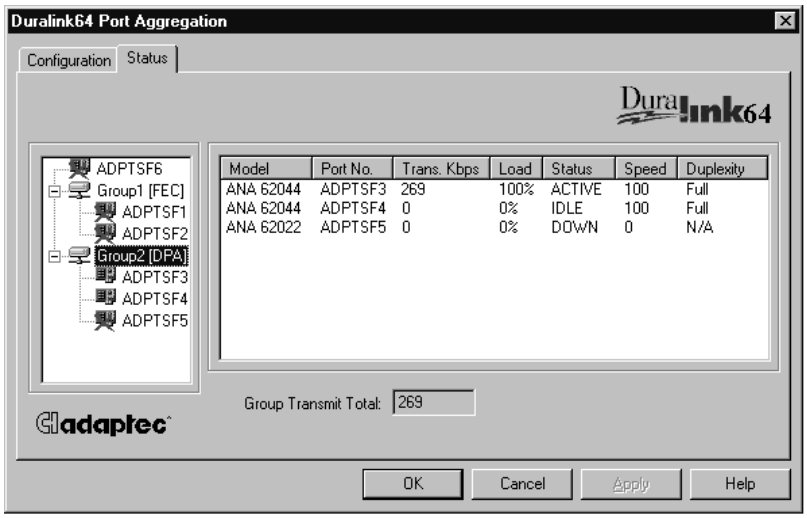

Figure 8-15. Status Tab

7. Click **OK** to exit.

Downloaded from www.Manualslib.com manuals search engine

Understanding the Status Tab

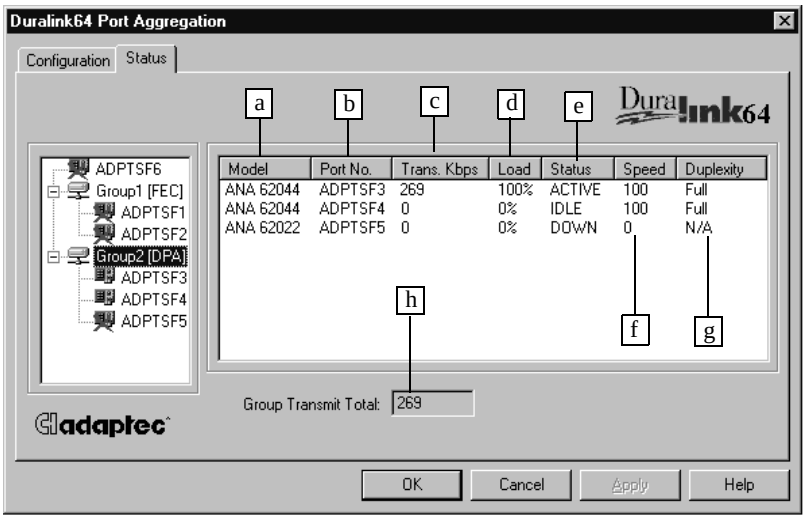

Figure 8-16. Status Tab Fields

Field Descriptions

a **Model** — Adaptec DuraLAN NIC model number.

b **Port No.** — Port identification assigned by the system.

c **Trans Kbps** — Total Kilobits per second (Kbps) transmitted per port (stand-alone and group). The Kbps sum of aggregated ports in a group equals the total Kbps transmitted by their group.

d **Load** — The percentage of transmit load carried by each port in a group. The percentage of a stand-alone port is always 100%. The percentage for a group is calculated as a percentage of bytes transmitted by the port over bytes transmitted by the group during the last screen refresh interval.

e **Status** — If the link is up and has transmitted data within the last screen refresh interval, ACTIVE is displayed.

If the link is up but the port has not transmitted any data within the time interval, IDLE is displayed.

If the link is down, DOWN is displayed.

Downloaded from www.Manualslib.com manuals search engine

f **Speed** — Speed is either 10 or 100. This value depends on the connection type you chose in *Configuring the Ports* on page 8-2.

g **Duplexity** — Duplexity is either half or full. This value depends on the connection type you chose in *Configuring the Ports* on page 8-2.

h **Group Transmit Total** — This field appears only when a group is selected.

Viewing the Groups

You can view the groups list in two ways:

- To view ports in a specific group, click the PLUS SIGN [+].
- To hide ports in a specific group, click the MINUS SIGN [-].
- Disabled ports are marked with an [x], such as ADPTSF5 shown below.

Figure 8-17. Example of disabled ports

Downloaded from www.Manualslib.com manuals search engine

Windows NT Performance Monitor

You can view system traffic for selected groups and stand-alone ports in the Performance Monitor, as shown in Figure 8-18. In this window, each line represents the performance of the group or port listed at the bottom of the screen. When a group / port's activity drops, its line drops. Use the following instructions to select ports and groups you wish to view.

1 From the Start menu, point to **Programs**, point to **Administrative Tools**, and then click **Performance Monitor**.

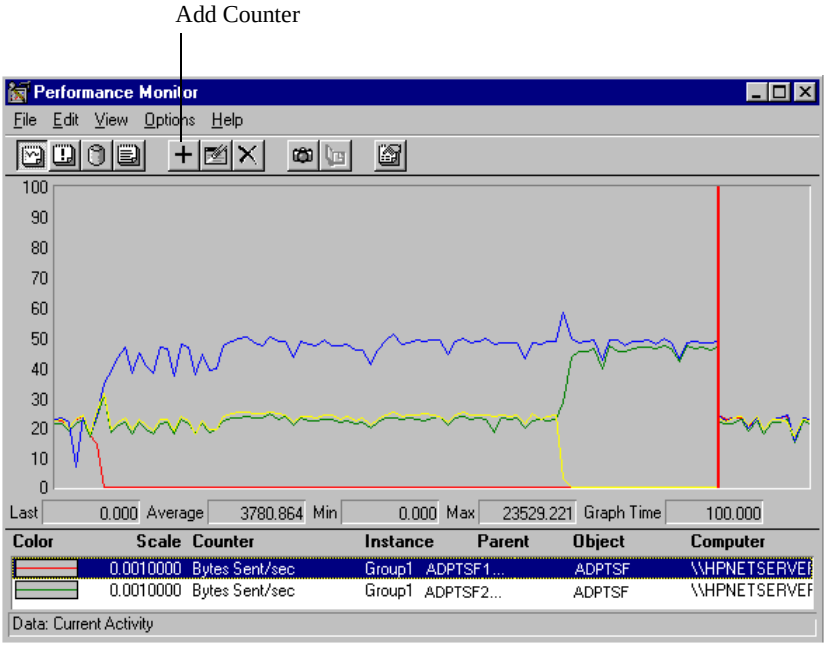

Figure 8-18. Performance Monitor

2 In the Performance Monitor, click the **Add** counter button to enter the Add to Chart window, shown in Figure 8-19.

Downloaded from www.Manualslib.com manuals search engine

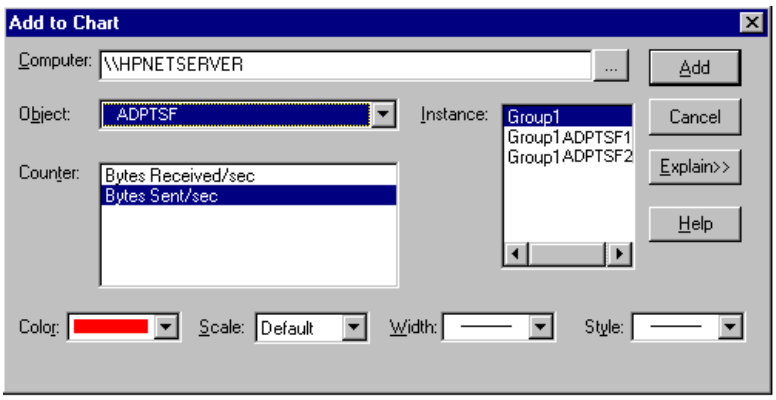

Figure 8-19. Add to Chart Window

3 From the Object list box, select **ADPTSF**.

4 In the Instance box, click the port or group, and then click the appropriate setting from the Counter box.

5 To distinguish ports and groups in the Performance Monitor, adjust the following parameters:

Color— is preset by the program for each selected group or port. You can set a specific color from the Color list box.

Scale—you can set the scale of the plot for better viewing.

Width—This allows you to set the width of the plot line.

Style—allows you to set the type of line that will be plotted for the selected group.

6 Repeat steps 4 and 5 for each appropriate port or group.

7 When you are done, click **Done**.

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

▼▼▼▼ Part 4

The Duralink64 Driver for NetWare

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

9

Duralink64 Standard Driver for NetWare

In This Chapter

Before you Begin	9-2
Note on NetWare	9-2
Install of Duralink64 Driver during NetWare 5.0 Operating System Installation	9-3
Installing the NetWare Standard Driver	9-4
Configuring the Ports	9-5
Assigning the Protocols	9-7
Viewing the Configuration	9-10
Restarting the Server	9-11
Removing Drivers	9-12

This chapter provides instructions for installing and configuring the DuraLAN Standard driver for NetWare 4.x or NetWare 5.0.

Downloaded from www.Manualslib.com manuals search engine

Before you Begin

- Verify that all system, memory, and NIC requirements are met, see *System Requirements* on page 1-2.
- Verify that the new Adaptec DuraLAN NIC(s) have been installed properly in the server, see Chapter 3, *DuraLAN NIC Installation*.
- Check your system for installed DuraLAN NIC drivers. If a DuraLAN Standard driver, Duralink64 Failover driver, or Duralink64 Port Aggregation driver exists, it must be removed. For information about driver removal see *Removing Drivers* on page 9-12.
- Verify that IntraNetWare Service Pack 6 or later is installed for NetWare 4.11. This pack may be downloaded from: **http://suport.novell.com**

Note on NetWare

When you are installing Adaptec DuraLAN NICs, it is a good idea to document where each port physically resides in the server, especially when two or more identical NICs exist. This is important because ports are identified by generic port names, such as Adptsf1, Adptsf2, Adptsf3, etc.

Port names are assigned to ports in the order that the system scans these ports at boot time. Consequently, whenever you physically rearrange the network cards, the port names change as well.

Downloaded from www.Manualslib.com manuals search engine

Install of Duralink64 Driver during NetWare 5.0 Operating System Installation

Follow this procedure when installing the Duralink driver during the installation of the NetWare 5.0 Operating System.

1. Install the NetWare 5.0 Operating System following the NetWare instructions until you reach the Network Boards screen, as shown below.

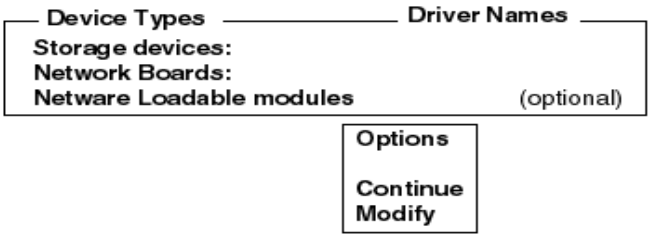

Figure 9-1. Network Boards Screen

2. Select **Modify** and press **Enter**.
3. Select the Network Boards field and press **Enter**.
4. Press **Insert** twice.
5. Press F3. The Specify Directory Path Window appears.

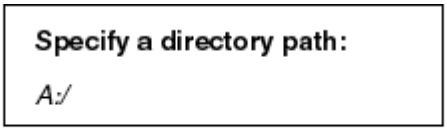

Figure 9-2. Device Types Screen

6. Insert the drivers diskette, press **Enter**.
7. When drivers finish loading return to Driver Summary.
8. Return to the NetWare installation process. Review the Network Boards screen. Verify that the correct drivers were installed. Note that one driver will be installed for each port.
9. Continue with the NetWare installation process.

Downloaded from www.Manualslib.com manuals search engine

Installing the NetWare Standard Driver

If you are installing NetWare on a new server, *do not* add the DuraLAN NIC at this time. When prompted to add the NIC, select **No**, and then continue with the NetWare installation.

Note: This driver uses 32 receive buffers for each port. Therefore, if you are using multiple ports, the number of receive buffers must be increased.
Type **load edit c:\nwserver\startup.ncf**, and then insert the following commands at the *end* of the file:
SET MINIMUM PACKET RECEIVE BUFFERS = 512
SET MAXIMUM PACKET RECEIVE BUFFERS = 1024

If you are installing NetWare 5.0 on a new server, please see *Install of Duralink64 Driver during NetWare 5.0 Operating System Installation* on page 9-3.

To install the standard driver for NetWare follow these steps:

1. Insert the Duralink64 NetWare 4.x and 5.0 diskette.
2. At the system prompt type: **a:\NWSERVER\setupsf** and press **Enter**. The Select Driver window appears.

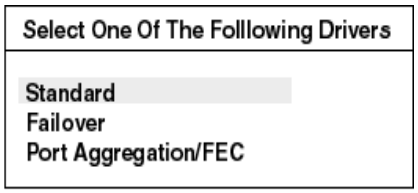

Figure 9-3. The Standard driver is selected in this illustration.

3. Select **Standard** and press **Enter**.
4. In the message indicating the New Adaptec NICs have been detected, press **Enter**.
5. Press **Enter** to continue through the messages that appear until the Board Configuration screen appears.
6. Continue to *Configuring the Ports* on page 9-5.

Downloaded from www.Manualslib.com manuals search engine

Configuring the Ports

After installing the Duralink64 Standard driver, use the following steps to configure the ports.

1 In the Main Menu, select **Configure Ports**, and then press **Enter**.

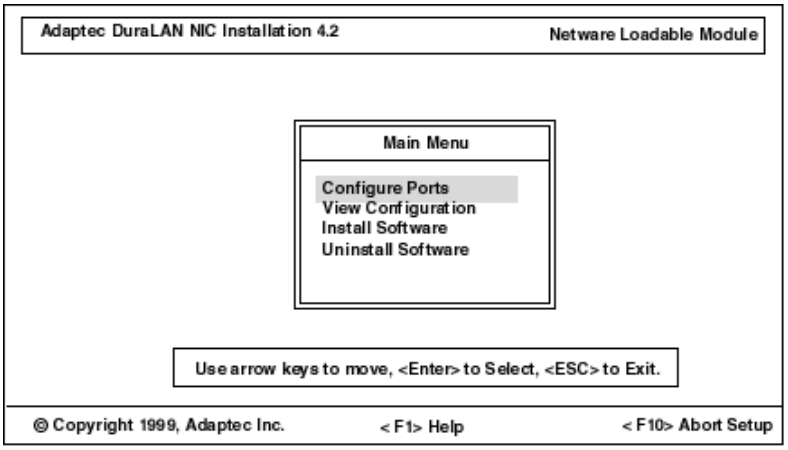

Figure 9-4. Duralink64 Standard Setup Main Menu

2 In the Ports screen, make sure you know which port names are assigned to the actual ports on the NIC.

No.	Port Name	NIC	Connection Type	Status
1	Adptsf1	ANA-62044/TX:[1]	Autodetect (default)	Enabled
2	Adptsf2	ANA-62044/TX:[2]	Autodetect (default)	Enabled
3	Adptsf3	ANA-62044/TX:[3]	Autodetect (default)	Enabled
4	Adptsf4	ANA-62044/TX:[4]	Autodetect (default)	Enabled
5	Adptsf5	ANA-62044/TX:[1]	Autodetect (default)	Enabled
6	Adptsf6	ANA-62044/TX:[2]	Autodetect (default)	Enabled
7	Adptsf7	ANA-62044/TX:[3]	Autodetect (default)	Enabled
8	Adptsf8	ANA-62044/TX:[4]	Autodetect (default)	Enabled

Figure 9-5. The port names (Adptsf1, Adptsf2, etc.) do not correspond to the physical PCI slot numbers on the motherboard.

Downloaded from www.Manualslib.com manuals search engine

3 **OPTIONAL**. The Autodetect (default) detects which device the port is connected to and negotiates the port speed and transmission mode accordingly. **Autodetect** is recommended; however, to change the connection type(s):

a Select the port, and then press **Enter**. (To select multiple ports, select the port, and then press **F5** one at a time.)

b In the Type of Connection menu, select the type, and then press **Enter**. (*Connection Types* on page A-2 provides descriptions.)

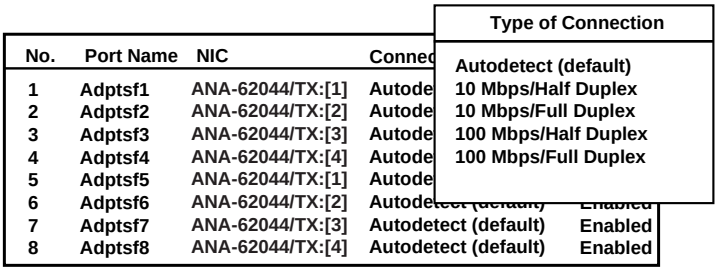

Figure 9-6. Type of Connection Menu

4 **OPTIONAL**. **Enabled** is the default status. To disable a port, select the port, and then press **Tab**.

5 Press **Esc** when you are done.

Downloaded from www.Manualslib.com manuals search engine

Assigning the Protocols

You can assign IP or IPX protocols to Failover pairs and stand-alone ports.

Note: The IPX protocol supports all four frame types and multiple frame types simultaneously. IP supports either Ethernet_II or Ethernet_SNAP, but never both at the same time.

1. In the Main Menu, select **Configure Protocols**, and then press **Enter**.
2. In the List of Ports box, select the port, and then press **Enter**.

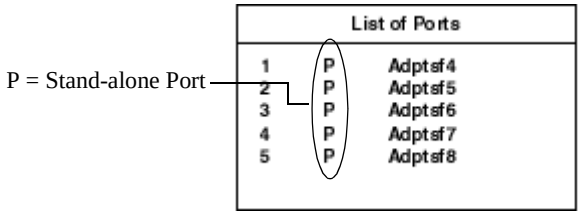

Figure 9-7. List of Ports/Failover Pairs Box

3. In the List of Protocols box, select the protocol for the selected Failover pair or port, and then press **Enter**.

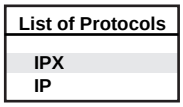

Figure 9-8. List of Protocols Box

Downloaded from www.Manualslib.com manuals search engine

Configuring IPX

a In the List of Frame Types box, select the frame type, and then press **Enter**.

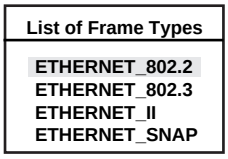

Figure 9-9. List of Frame Types Box

b In the IPX Network Number box, type the network number, and then press **Enter**.

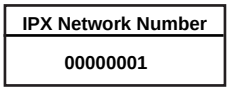

Figure 9-10. IPX Network Number Box

c Repeat steps a and b for each frame type you wish to use.

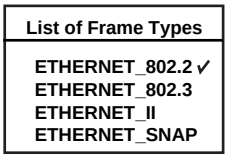

Figure 9-11. List of Frame Types

d Press **Esc** to return to the List of Protocols box.

Downloaded from www.Manualslib.com manuals search engine

Configuring IP

a In the List of Frame Types box, select the frame type, and then press **Enter**.

b In the IP Parameters box, select **Enter IP Address**, and then press **Enter**.

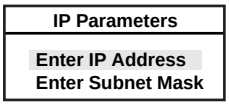

Figure 9-12. IP Parameters Box

c In the IP Address box, type the address number, and then press **Enter**.

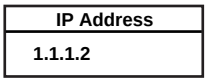

Figure 9-13. IP Address Box

d In the IP Parameters box, select **Enter Subnet Mask**, and then press **Enter**.

e In the Subnet Mask box, type the corresponding subnet mask, and then press **Enter**.

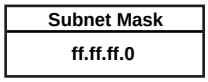

Figure 9-14. Subnet Mask Box

f Press **Esc**.

g Repeat Steps a through f for each appropriate port or pair.

h Press **Esc** until you return to the List of Ports / Failover Pairs box.

4 Repeat Steps 1 through 3 for any other ports you wish to configure.

5 Press **Esc** until you return to the Main Menu.

6 Continue to *Viewing the Configuration*.

Downloaded from www.Manualslib.com manuals search engine

Viewing the Configuration

It is important to verify the current port configurations before saving them to the server.

1 From the Main Menu, select **View Configuration**, and press **Enter**.

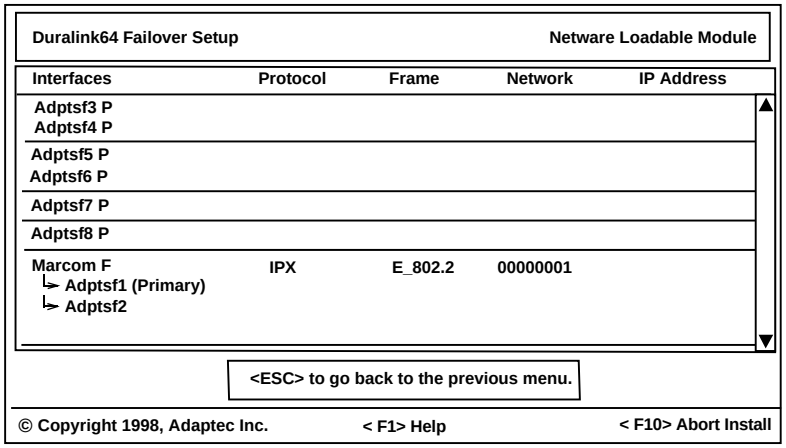

Figure 9-15. View Configuration Screen

2 Press **Esc** to return to the Main Menu.

Downloaded from www.Manualslib.com manuals search engine

Restarting the Server

After installing the Standard driver and configuring the ports, you must restart the server.

1. In the Internetworking Configuration menu, press **Esc**.
2. In the Exit INETCFG box, select **Yes**, and then press **Enter**.
3. In the Add Initialize Commands to autoexec.ncf box, select **Yes**, and then press **Enter**.
4. The next screen indicates that the configuration will be activated. Press **Enter**.
5. At the server console type **down** and then press **Enter**.
6. Type **restart server** and then press **Enter**.
7. **OPTIONAL**. After the server is restarted you can review the current settings. Type **config** at the console prompt, and then press **Enter**.

Troubleshooting Tip

At system reboot, I receive a message that the NIC configuration contains invalid settings. What should I do?

1. Follow the instructions at the server prompt.
2. Document each of your selections.
3. Return to inetcfg.
4. Use the Internetworking Configuring menu to access those screens you must modify.

Downloaded from www.Manualslib.com manuals search engine

Removing Drivers

The following procedures are to be used if a new driver needs to be installed to replace an existing driver.

Removing the DuraLAN Standard Driver

To remove the DuraLAN Standard Driver installed from Duralink 4.10, using inetcfg, use the following steps:

1. Insert the Duralink64 for NetWare Disk.
2. At the server prompt, type **load inetcfg** and press **Enter**.
3. In the Internetworking Configuration menu, select **Boards**, and then press **Enter**. A list of NICs appears.
4. In the Configured Boards screen, delete all existing Adaptec NICs drivers by selecting the NIC(s) and pressing **Del**.
5. When you are finished, press **Esc**.
6. In the Internetworking Configuration menu, select **Manage Configurations**, and press **Enter**.
7. To save changes, select **Yes**.
8. Press **Esc** twice.
9. To exit inetcfg, select **Yes**.
10. At the server console, type **down** and then press **Enter**.
11. Type **restart server** and then press **Enter**.

To remove the DuraLAN Standard Driver installed from Duralink 4.2, use the following steps:

1. Insert the Duralink64 for NetWare Disk.
2. At the server prompt, type: **load a:\Newserver\setupsf** and press **Enter**.
3. Select **Standard** from the Adaptec Select Driver Window.
4. In the main menu select **Uninstall software** and press **Enter**.
5. In the Uninstall the Software box, select **Yes** end press **Enter**.

❒

Downloaded from www.Manualslib.com manuals search engine

10

Duralink64 Failover for NetWare

In This Chapter

Before you Begin	10-2
Note on NetWare	10-2
Installing the NetWare Failover Driver	10-3
Configuring the Ports	10-4
Creating the Failover Pairs	10-6
Assigning the Protocols	10-9
Viewing the Configuration	10-12
Copying and Saving the Configuration	10-13
Viewing the System Status	10-14
Modifying the Driver Configuration	10-16
Removing Drivers	10-17

This chapter provides instructions for installing Duralink64 Failover on a server running NetWare 4.x or NetWare 5.0.

Downloaded from www.Manualslib.com manuals search engine

Before you Begin

- Verify that all system, memory, and NIC requirements are met, see *System Requirements*, page 1-2.
- Verify that the new Adaptec DuraLAN NIC(s) have been installed properly in the server, see Chapter 3, *DuraLAN NIC Installation*.
- Check your system for installed DuraLAN NIC drivers. If a DuraLAN Standard driver, Duralink64 Failover driver, or Duralink64 Port Aggregation driver exists, it must be removed. For information about driver removal see *Removing Drivers*, page 9-12.
- Verify that IntraNetWare Service Pack 6 or later is installed for NetWare 4.11. This pack may be downloaded from: **http://suport.novell.com**

Note on NetWare

When you are installing Adaptec DuraLAN NICs, it is a good idea to document where each port physically resides in the server, especially when two or more identical NICs exist. This is important because ports are identified by generic port names, such as Adptsf1, Adptsf2, Adptsf3, etc.

Port names are assigned to ports in the order that the system scans these ports at boot time. Consequently, whenever you physically rearrange the network cards, the port names change as well.

After you have installed Duralink64 Failover use configsf to reconfigure the driver when necessary. (See *Modifying the Driver Configuration*, page 10-16.)

Downloaded from www.Manualslib.com manuals search engine

Installing the NetWare Failover Driver

If you are installing NetWare 4.x on a new server, *do not* add the DuraLAN NIC at this time. When prompted to add the NIC, select **No**, and then continue with the NetWare installation.

If you are installing NetWare 5.0 on a new server, please see *Install of Duralink64 Driver during NetWare 5.0 Operating System Installation*, page 9-3.

Note: This driver uses 32 receive buffers for each port. Therefore, if you are using multiple ports, the number of receive buffers must be increased.
Type **load edit c:\nwserver\startup.ncf**, and then insert the following commands at the *end* of the file:
SET MINIMUM PACKET RECEIVE BUFFERS = 512
SET MAXIMUM PACKET RECEIVE BUFFERS = 1024

To install the Failover driver for NetWare follow these steps:

1. Insert the Duralink64 Driver for NetWare diskette.
2. At the system console prompt, type: **a:\nwserver\setupsf**
3. Press **Enter**. The Select Driver window appears.

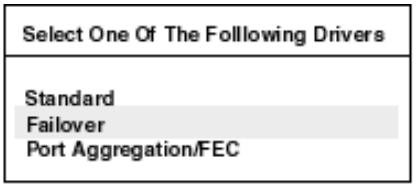

Figure 10-1. The Select Driver Window

4. Select **Failover** and press **Enter**.
5. In the message indicating that New Adaptec NICs have been detected, press **Enter**.
6. Continue to *Configuring the Ports*, page 10-4.

Downloaded from www.Manualslib.com manuals search engine

Configuring the Ports

1 In the Main Menu, select **Configure Ports**, and then press **Enter**.

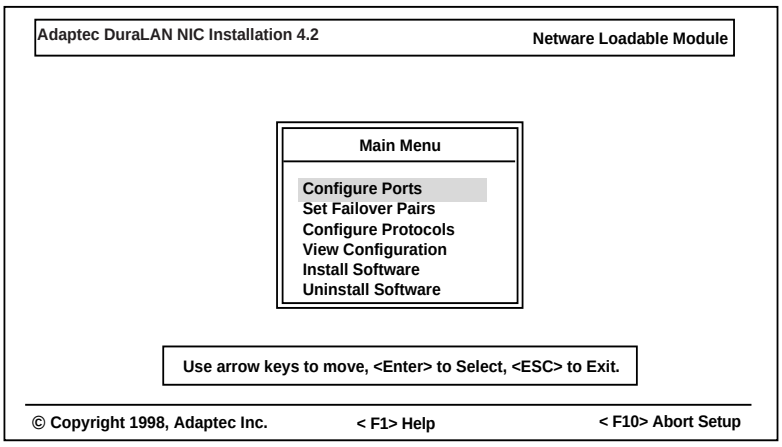

Figure 10-2. Duralink64 Failover Setup Main Menu

2 In the Ports screen, make sure you know which port names are assigned to the actual ports on the NIC. The port names (Adptsf1, Adptsf2, etc) do not correspond to the physical PCI slot numbers on the motherboard.

No.	Port Name	NIC	Connection Type	Status
1	Adptsf1	ANA-62044/TX:[1]	Autodetect (default)	Enabled
2	Adptsf2	ANA-62044/TX:[2]	Autodetect (default)	Enabled
3	Adptsf3	ANA-62044/TX:[3]	Autodetect (default)	Enabled
4	Adptsf4	ANA-62044/TX:[4]	Autodetect (default)	Enabled
5	Adptsf5	ANA-62044/TX:[1]	Autodetect (default)	Enabled
6	Adptsf6	ANA-62044/TX:[2]	Autodetect (default)	Enabled
7	Adptsf7	ANA-62044/TX:[3]	Autodetect (default)	Enabled
8	Adptsf8	ANA-62044/TX:[4]	Autodetect (default)	Enabled

Figure 10-3. Ports Screen

Downloaded from www.Manualslib.com manuals search engine

3 **OPTIONAL**. The Autodetect default detects which device the port is connected to and negotiates the port speed and transmission mode accordingly. Autodetect is recommended; however, to change the connection type(s):

   a Select the port, and then press **Enter**. (To select multiple ports, select the port, and then press **F5** one at a time.)

   b In the Type of Connection menu, select the type, and then press **Enter**. (*Connection Types*, page A-2 provides descriptions.)

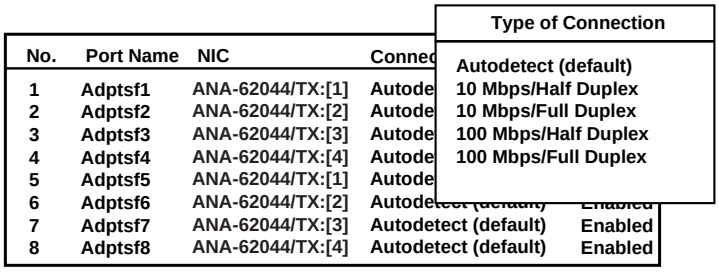

Figure 10-4. Type of Connection Menu

4 **OPTIONAL**. **Enabled** is the default status. To disable a port, select the port, and then press **Tab**.

5 Press **Esc** when you are done.

6 Continue to *Creating the Failover Pairs*.

Downloaded from www.Manualslib.com manuals search engine

Creating the Failover Pairs

The Failover pair consists of two ports only: the primary port and the backup port.

1. In the Main Menu, select **Set Failover Pairs**, and then press **Enter**.
2. In the List of Existing Pairs box, press **Ins**.

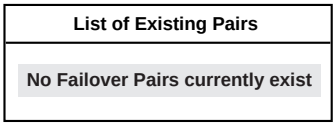

Figure 10-5. List of Existing Pairs Box

3. Select the pair, and then press **Enter.** A default pair name uses the naming convention: first pair= Pair1, second pair=Pair2, third pair=Pair3, etc.

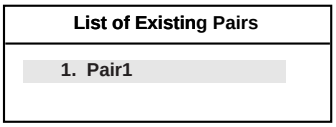

Figure 10-6. List of Existing Pairs

4. In the Failover Pair Configuration menu, select **Add/Remove Ports**, and then press **Enter**.

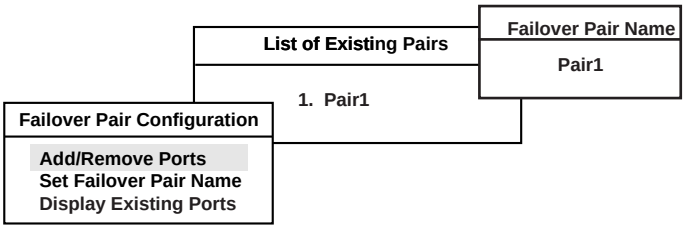

Figure 10-7. Failover Pair Configuration Menu

Downloaded from www.Manualslib.com manuals search engine

5 In the Existing Ports box, press **Ins**. The message No Ports Present appears the first time you add a new pair.

Figure 10-8. Existing Ports Box

6 In the Available Ports box, select the primary port, and then press **Enter**.

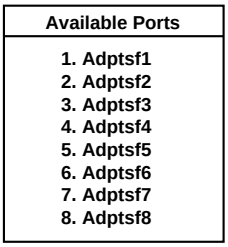

Figure 10-9. Available Ports Box

7 Press **Ins** to return to the Available Ports box.

8 Select the secondary port, and then press **Enter**.

9 **Optional.** In the Existing Ports box, the check mark indicates the primary port. To change the primary port, select the second port, and then press **Enter**.

10 Press **Esc** to apply the ports. The selected ports appear in the Existing Ports box.

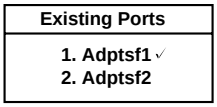

Figure 10-10. Existing Ports Box

Downloaded from www.Manualslib.com manuals search engine

11 **OPTIONAL.** To rename the default Failover pair name:

a From the Failover Pair Configuration menu, select **Set Failover Pair Name**, and press **Enter**.

b In the Failover Pair Name box, type the pair name, and then press **Enter.**

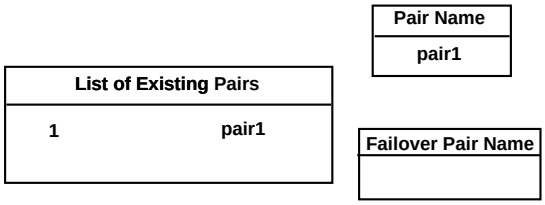

Figure 10-11. Failover Pair Box

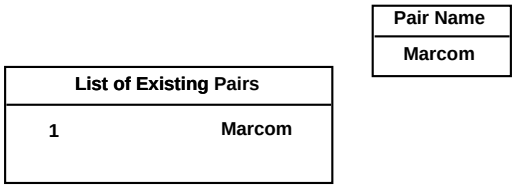

Figure 10-12. Pair Name Box

12 To review the ports assigned to the pair, select **Display Existing Ports** from the Set Failover Pairs menu, and then press **Enter**. When you select Display Existing Ports, this box is displayed as read-only.

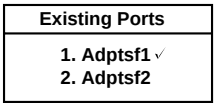

Figure 10-13. Existing Ports Box

13 Press **Esc** until you return to the Main Menu.

14 To create more pairs, repeat Steps 1 through 13.

15 Continue to *Assigning the Protocols*.

Downloaded from www.Manualslib.com manuals search engine

Assigning the Protocols

You can assign IP or IPX protocols to Failover pairs and stand-alone ports.

Note: The IPX protocol supports all four frame types and multiple frame types simultaneously. IP supports either Ethernet_II or Ethernet_SNAP, but never both at the same time.

1. In the Main Menu, select **Configure Protocols**, and then press **Enter**.
2. In the List of Ports / Failover Pairs box, select the Failover pair or port, and then press **Enter**.

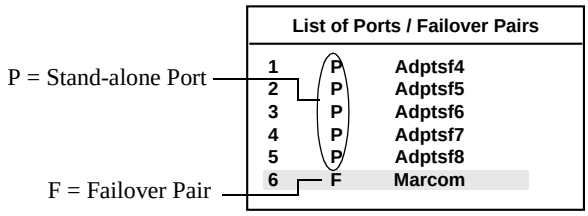

Figure 10-14. List of Ports/Failover Pairs Box

3. In the List of Protocols box, select the protocol for the selected Failover pair or port, and then press **Enter**.

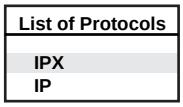

Figure 10-15. List of Protocols Box

Downloaded from www.Manualslib.com manuals search engine

Configuring IPX

a In the List of Frame Types box, select the frame type, and then press **Enter**.

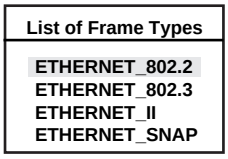

Figure 10-16. List of Frame Types Box

b In the IPX Network Number box, type the network number, and then press **Enter**.

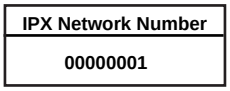

Figure 10-17. IPX Network Number Box

c Repeat steps a and b for each frame type you wish to use.

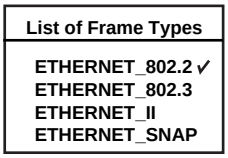

Figure 10-18. List of Frame Types

d Press **Esc** to return to the List of Protocols box.

Downloaded from www.Manualslib.com manuals search engine

Configuring IP

a In the List of Frame Types box, select the frame type, and then press **Enter**.

b In the IP Parameters box, select **Enter IP Address**, and then press **Enter**.

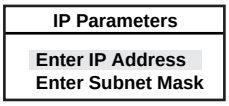

Figure 10-19. IP Parameters Box

c In the IP Address box, type the address number, and then press **Enter**.

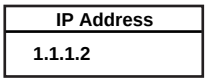

Figure 10-20. IP Address Box

d In the IP Parameters box, select **Enter Subnet Mask**, and then press **Enter**.

e In the Subnet Mask box, type the corresponding subnet mask, and then press **Enter**.

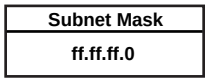

Figure 10-21. Subnet Mask Box

f Press **Esc**.

g Repeat Steps a through f for each appropriate port or pair.

h Press **Esc** until you return to the List of Ports / Failover Pairs box.

4 Repeat Steps 1 through 3 for any other port or pair you wish to configure.

5 Press **Esc** until you return to the Main Menu.

6 Continue to *Viewing the Configuration*.

Downloaded from www.Manualslib.com manuals search engine

Viewing the Configuration

It is important to verify the current port configurations before saving them to the server.

1. From the Main Menu, select **View Configuration**, and press **Enter**. The View Configuration screen appears.

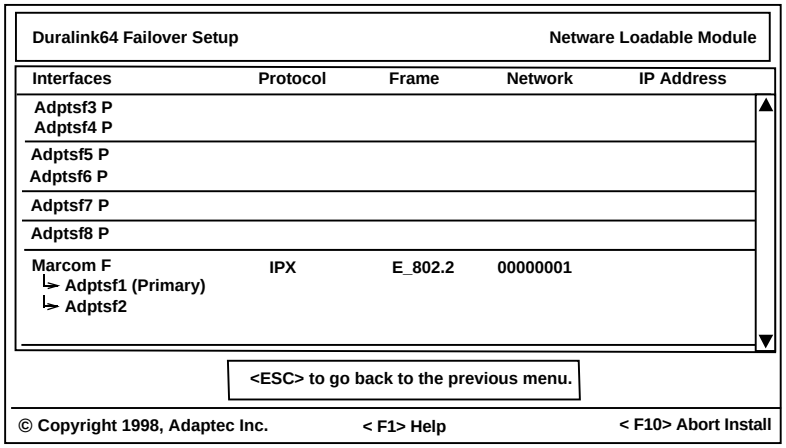

Figure 10-22. View Configuration Screen

2. Press **Esc** to return to the Main Menu.
3. Continue to *Copying and Saving the Configuration*.

Downloaded from www.Manualslib.com manuals search engine

Copying and Saving the Configuration

After verifying all port and group configurations, you can install the program and configuration-related files to the server.

1. From the Main Menu, select **Install Software**, and then press **Enter**.
2. When the Copy New Files box appears, select **Yes**, and then press **Enter**.

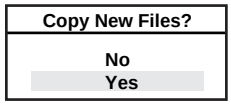

Figure 10-23. Copy New Files Box

3. From the Main Menu, press **Esc** to exit the program.
4. In the Save Configuration box, select **Save and Quit**. The configuration data is saved in sys:\etc\configsf.ncf.
   - If you do not want to not save the changes, select **Quit Without Saving**, and then press **Enter**.
   - To return to the Main Menu, select **Return to Previous Menu**, and then press **Enter**.
5. At the system console prompt, type **Down** and then press **Enter**.
6. Type **Restart Server**, and then press **Enter**. The server restarts and opens the Failover Status screen, which must appear before logging on clients or using the server console.
7. Continue to *Viewing the System Status*.

Downloaded from www.Manualslib.com manuals search engine

Viewing the System Status

After installing Duralink64 Failover through fosetsf, you can view the system status. This program automatically opens whenever you restart the server.

To manually enter status, at the system console prompt, type: **load status.** TheDuralink64 Failover status screen appears.

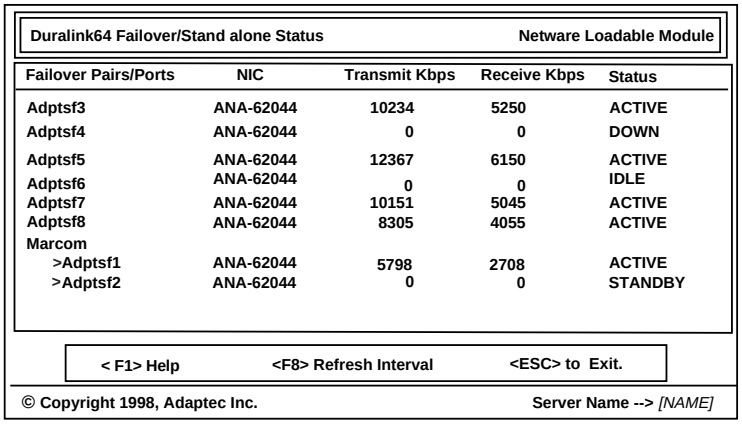

Figure 10-24. Duralink64 Failover Status Screen

Note: This requires that the Failover software be loaded or an error will occur. If you have not rebooted since you installed the software, reboot and the above screen will appear automatically.

This module can be used to identify the physical ports by determining the status when unplugging network connections.

Downloaded from www.Manualslib.com manuals search engine

Element Descriptions

A status screen is provided, showing the following information:

- NIC model number.
- Transmit Kbps (Kilobits per second) per port.
- Receive Kbps per port.
- The present status of all ports and Failover Pairs.
  - **ACTIVE**: This port is currently used for data transfer, and is connected with data being sent and / or received.
  - **IDLE**: This port is currently used for data transfer, and is connected with no data being sent or received.
  - **STANDBY**: This port currently not used for data transfer, and is connected with no data being sent or received.
  - **DOWN**: Port is not connected, or the link is down.

F Keys

F1— provides on-line help for each screen.

F8— Changes the refresh interval. Refresh interval is a user-selectable refresh cycle in seconds (default is 1 second). This is the interval by which the utility will refresh the status.

Downloaded from www.Manualslib.com manuals search engine

Modifying the Driver Configuration

After installing Duralink64 Failover for NetWare, use configsf to add, remove, or change a configuration for Adaptec NIC drivers. You will be familiar with the screens in this program since they are similar to the ones in fosetsf.

1. At the system console prompt, type **load configsf** and then press **Enter**.
2. In the message screen indicating that ports were added / removed, press **Esc**.
3. Refer to *Installing the NetWare Failover Driver*, page 10-3 for instructions.

Downloaded from www.Manualslib.com manuals search engine

Removing Drivers

The following procedures are to be used if a new driver needs to be installed to replace an existing driver.

Removing the Duralink64 Failover Driver

To remove the Duralink64 Failover Driver use the following steps:

1. Insert the Duralink64 Drivers For Netware diskette.
2. At the system console prompt, type l**oad a:\nwserver\setupsf** and press **Enter**.
3. Select Failover from the Adaptec window.
4. In the Main Menu, select **Uninstall Software**, and press **Enter**.
5. In the Uninstall the Software box, select **Yes** and press **Enter**.
6. In the Main Menu, Press **Esc** to exit setupsf.

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

11

Duralink64 Port Aggregation for NetWare

In this Chapter

Before you Begin	11-2
Note on NetWare	11-2
Installing the NetWare Port Aggregation Driver	11-3
Configuring Ports	11-4
Creating Port Aggregation Groups	11-6
Creating Fast EtherChannel Groups	11-9
Assigning Protocols	11-12
Verifying Configuration	11-15
Viewing System Status	11-17
Modifying Driver Configurations	11-18
Removing Drivers	11-19

This chapter provides instructions for configuring Duralink64 Port Aggregation on a server running NetWare 4.x or NetWare 5.0.

Downloaded from www.Manualslib.com manuals search engine

Before you Begin

- Verify that all system, memory, and NIC requirements are met, see *System Requirements* on page 1-2.
- Verify that the new Adaptec DuraLAN NIC(s) have been installed properly in the server, see Chapter 3, *DuraLAN NIC Installation*.
- Check your system for installed DuraLAN NIC drivers. If a DuraLAN Standard driver, Duralink64 Failover driver, or Duralink64 Port Aggregation driver exists, it must be removed. For information about driver removal see *Removing Drivers* on page 9-12.
- Verify that IntraNetWare Service Pack 6 or later is installed for NetWare 4.11. This pack may be downloaded from: **http://suport.novell.com**

Note on NetWare

When you are installing Adaptec DuraLAN NICs, it is a good idea to document where each port physically resides in the server, especially when two or more identical NICs exist. This is important because ports are identified by generic port names, such as Adptsf1, Adptsf2, Adptsf3, etc.

Port names are assigned to ports in the order that the system scans these ports at boot time. Consequently, whenever you physically rearrange the network cards, the port names change as well.

After you install Duralink64 Port Aggregation, use configsf to reconfigure the drivers when necessary. (See *Modifying Driver Configurations* on page 11-18.)

Downloaded from www.Manualslib.com manuals search engine

Installing the NetWare Port Aggregation Driver

If you are installing NetWare 4.x on a new server, *do not* add the DuraLAN NIC at this time. When prompted to add the NIC, select **No**, and then continue with the NetWare installation.

If you are installing NetWare 5.0 on a new server, please see *Install of Duralink64 Driver during NetWare 5.0 Operating System Installation* on page 9-3.

Note: This driver uses 32 receive buffers for each port. Therefore, if you are using multiple ports, the number of receive buffers must be increased.
Type **load edit c:\nwserver\startup.ncf**, and then insert the following commands at the *end* of the file:
SET MINIMUM PACKET RECEIVE BUFFERS = 512
SET MAXIMUM PACKET RECEIVE BUFFERS = 1024

To install the Port Aggregation driver for NetWare follow these steps:

1. Insert the Duralink64 Driver for NetWare 4.x / 5.0 diskette.
2. At the system prompt, type: **a:\nwserver\setupsf**
3. Press **Enter**. The Select Driver window appears.

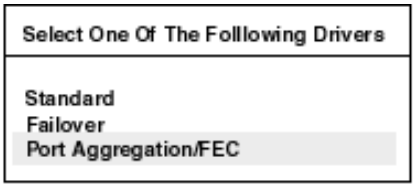

Figure 11-1. The Select Driver Window

4. Select **Port Aggregation/FEC** and press **Enter**.
5. In the message indicating the New Adaptec NICs have been detected, press **Enter**.
6. Continue to *Configuring Ports* on page 11-4.

Downloaded from www.Manualslib.com manuals search engine

Configuring Ports

1 In the Main Menu, select **Configure Ports**, and then press **Enter**.

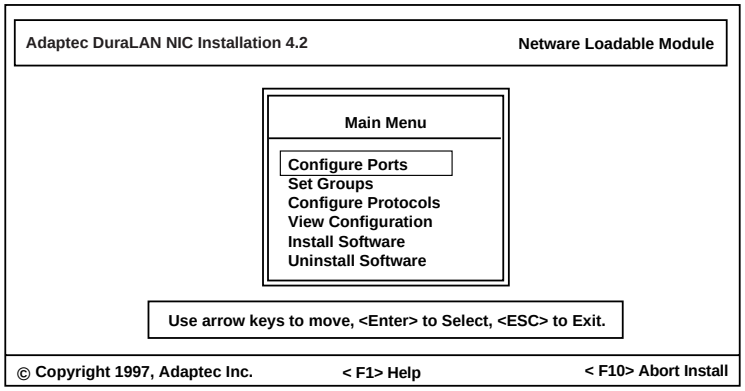

Figure 11-2. Duralink64 Port Aggregation Setup Main Menu

2 In the Configuration Ports screen, make sure you know which port names correspond to the actual ports in the server.

No.	Port Name	NIC	Connection Type	Status
1	Adptsf1	ANA-62044/TX:[1]	Autodetect (default)	Enabled
2	Adptsf2	ANA-62044/TX:[2]	Autodetect (default)	Enabled
3	Adptsf3	ANA-62044/TX:[3]	Autodetect (default)	Enabled
4	Adptsf4	ANA-62044/TX:[4]	Autodetect (default)	Enabled
5	Adptsf5	ANA-62044/TX:[1]	Autodetect (default)	Enabled
6	Adptsf6	ANA-62044/TX:[2]	Autodetect (default)	Enabled
7	Adptsf7	ANA-62044/TX:[3]	Autodetect (default)	Enabled
8	Adptsf8	ANA-62044/TX:[4]	Autodetect (default)	Enabled

Figure 11-3. In this scenario, 2 quad port NICs exist; thus, eight ports are found. [1] is always the top port of a NIC.

Downloaded from www.Manualslib.com manuals search engine

3 **OPTIONAL**. The Autodetect default detects which device the port is connected to and adjusts the port speed and transmission mode accordingly. Autodetect is recommended; however, to change the connection type(s):

   a Select the port, and then press **Enter**. (To select multiple ports, select the port, and then press **F5** one at a time.)

   b In the Type of Connection menu, select the type, and then press **Enter**. (*Connection Types* on page A-2 provides descriptions.)

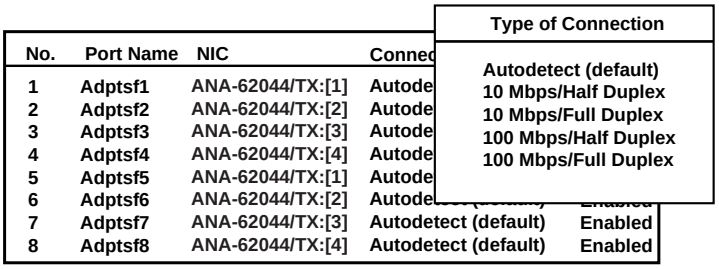

Figure 11-4. Type of Connection Menu

4 **OPTIONAL**. Enabled is the status default. To disable a port, select the port and then press **Tab**.

5 When you are finished, press **Esc** to return to the Main Menu.

6 Continue to *Creating Port Aggregation Groups* on page 11-6.

Downloaded from www.Manualslib.com manuals search engine

Creating Port Aggregation Groups

After configuring ports, you may create Port Aggregation groups using the following steps:

1. In the Main Menu, select **Set Groups**, and then press **Enter**.
2. In the List of Existing Groups box, press **Ins** to add a new group.

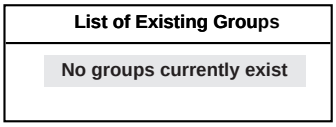

Figure 11-5. This message appears the first time you add a new group.[1]

3. Select the group, and then press **Enter**.

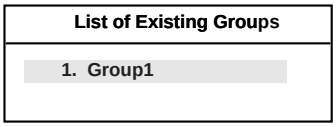

Figure 11-6. Group1 is the new group's default name.

4. In the Group Configuration menu, select **Add/Remove Ports**, and then press **Enter**.

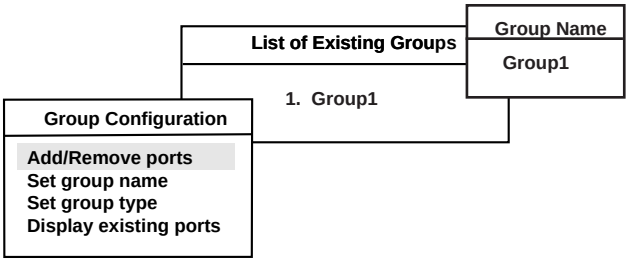

Figure 11-7. Group Configuration Menu

[1] If you are in configsf, this message appears only when no groups are found.

Downloaded from www.Manualslib.com manuals search engine

5 In the Existing Ports box, press **Ins**. The message No Ports Present appears the first time you add a new group.

Figure 11-8. This message appears the first time you add a new group.

6 In the Available Ports box, use **F5** to select the ports for the new group, and then press **Enter**.

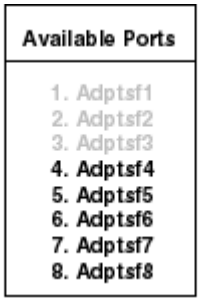

Figure 11-9. For this scenario, three ports are selected for the new group.

7 Press **Esc** to return to the Group Configuration menu.

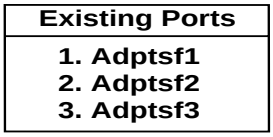

Figure 11-10. The selected ports are transferred to the Existing Ports box.

8 In the Group Configuration menu, select **Group Type** and press **Enter.** The Group Type menu appears**.**

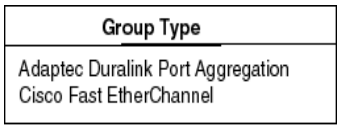

Figure 11-11. Group Type menu

Downloaded from www.Manualslib.com manuals search engine

9 In the Group Type menu select, **Adaptec Duralink Port Aggregation** and press **Enter**.

10 Press the **Esc** key to return to the Group Configuration menu.

11 **OPTIONAL.** setupsf automatically assigns a name to each new group. For example, the first group=Group1. To assign a unique name to a group:

a From the Group Configuration menu, select **Set Group Name**, and then press **Enter**.

b In the Group Name box, type the group name, and then press **Enter**.(This field allows up to 20 characters.)

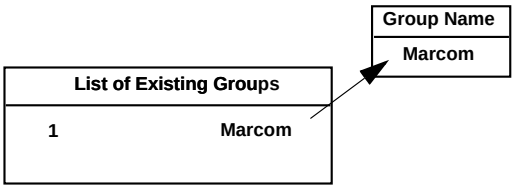

Figure 11-12. This group will be called Marcom for the Marketing Department's network.

12 To create another group, repeat steps 2 through 11.

13 Press **Esc** until you return to the Main Menu.

14 Continue to *Assigning Protocols* on page 11-12.

Downloaded from www.Manualslib.com manuals search engine

Creating Fast EtherChannel Groups

Fast EtherChannel supports either two or four ports. One, three, or more than four ports are not acceptable. After configuring ports, you may create Fast EtherChannel groups using the following steps:

1. In the Main Menu, select **Set Groups**, and then press **Enter**.
2. In the List of Existing Groups box, press **Ins** to add a new group. The message No Ports Present appears the first time you add a new group.

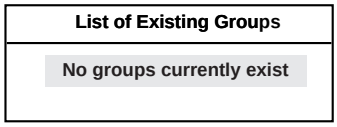

Figure 11-13. This message appears the first time you add a new group.[1]

3. Select the group, and then press **Enter**.

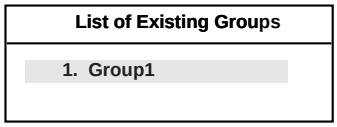

Figure 11-14. Group1 is the new group's default name.

4. In the Group Configuration menu, select **Add/Remove ports**, and then press **Enter**. The Group Type menu appears.

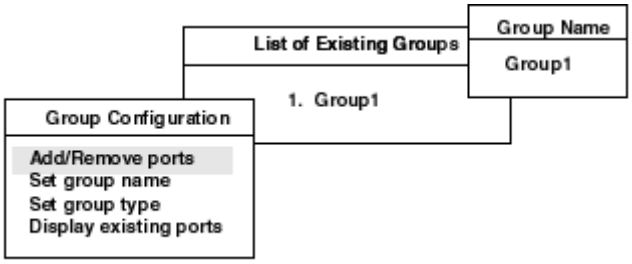

Figure 11-15. Group Configuration Menu

[1] If you are in configsf, this message appears only when no groups are found.

Downloaded from www.Manualslib.com manuals search engine

5 In the Existing Ports box, press **Ins**. The message No Ports Present appears the first time you add a new group.

Figure 11-16. This message appears the first time you add a new group.

6 In the Available Ports box, use **F5** to select the ports for the new group, and then press **Enter**.

Figure 11-17. For this scenario, four ports are selected for the new group.

7 Press **Esc** to return to the Group Configuration menu.

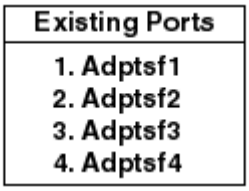

Figure 11-18. The selected ports are transferred to the Existing Ports box.

Downloaded from www.Manualslib.com manuals search engine

8 In the Group Configuration menu, select **Group Type** and press **Enter.** The Group Type menu appears**.**

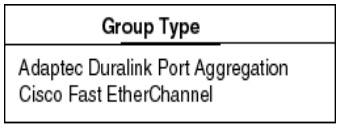

Figure 11-19. Group Type menu

9 In the Group Type menu select, **Cisco Fast EtherChannel** and press **Enter**.

10 Press the **Esc** key to return to the Group Configuration menu.

11 **OPTIONAL.** setupsf automatically assigns a name to each new group. For example, the first group=Group1. To assign a unique name to a group:

a From the Group Configuration menu, select **Set Group Name**, and then press **Enter**.

b In the Group Name box, type the group name, and then press **Enter**.(This field allows up to 20 characters.)

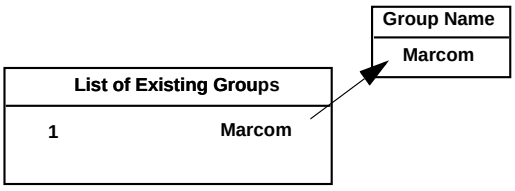

Figure 11-20. This group will be called Marcom for the Marketing Department's network.

12 To create another group, repeat steps 2 through 11.

13 Press **Esc** until you return to the Main Menu.

14 Continue to *Assigning Protocols* on page 11-12.

Downloaded from www.Manualslib.com manuals search engine

Assigning Protocols

You can assign the IP or IPX protocols to groups and stand-alone ports. The IPX protocol supports the following frame types simultaneously:

- ETHERNET_802.2
- ETHERNET_802.3
- ETHERNET_II
- ETHERNET_SNAP

IP supports either ETHERNET_II or ETHERNET_SNAP, but never both at the same time.

1. In the Main Menu, select **Configure Protocols**, and then press **Enter**.
2. In the List of Ports / Groups box, select the group or port, and then press **Enter**. The virtual port— Marcom—requires one protocol only.[1]

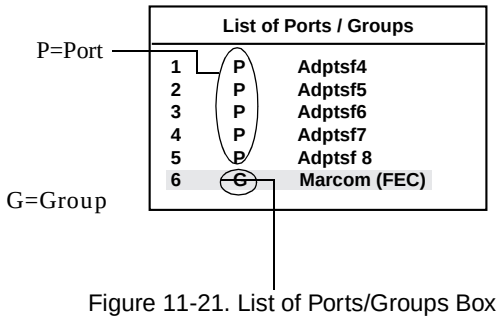

Figure 11-21. List of Ports/Groups Box

[1] Refer to the List of Existing Groups box to verify which ports are assigned to a particular group.

Downloaded from www.Manualslib.com manuals search engine

3 In the List of Protocols box, select the protocol for the current group / port, and then press **Enter**.

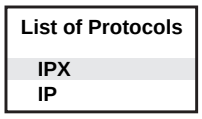

Figure 11-22. List of Protocols Box

– If you are configuring IPX:

a In the List of Frame Types box, select the frame type, and then press **Enter**.

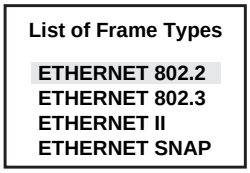

Figure 11-23. Marcom will be bound with ETHERNET 802.2.

b In the IPX Network Number box, type a unique IPX network number, and then press **Enter**.

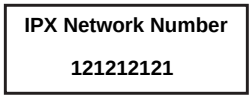

Figure 11-24. Example of an IPX network number.

c Repeat steps a and b for each frame type you wish to use. A check indicates enabled frame types.

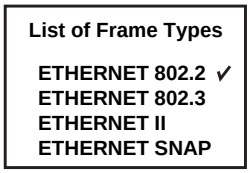

Figure 11-25. Marcom and ETHERNET_802.2 are bound.

d Press **Esc** to return to the List of Protocols box.

Downloaded from www.Manualslib.com manuals search engine

– If you are configuring IP:

a In the List of Frame Types box, select the frame type, and then press **Enter**.

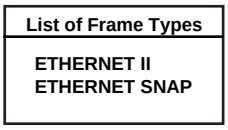

Figure 11-26. List of Frame Types Box

b In the IP Parameters box, select **Enter IP Address**, and then press **Enter**.

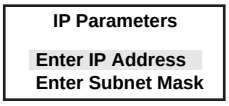

Figure 11-27. IP Parameters Box

c In the IP Address box, type the address number, and then press **Enter**.

d In the IP Parameters box, select **Enter Subnet Mask**, and then press **Enter**.

e In the IP Subnet Mask Number box, type the subnet mask, and then press **Enter**.

f Repeat steps a through e for each appropriate port or group.

g Press **Esc** twice to return to the List of Protocols box.

4 Repeat steps 2 and 3 for any other group or port you wish to configure.

5 Press **Esc** to return to the Main Menu.

6 Continue to *Verifying Configuration*.

Downloaded from www.Manualslib.com manuals search engine

Verifying Configuration

You should verify the current port configurations before saving them to the server.

1 From the Main Menu, select **View Configuration**, and then press **Enter**. The View Configuration screen appears.

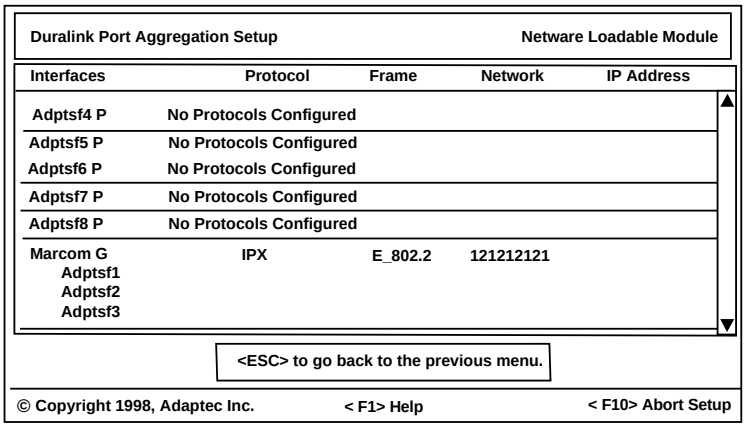

Figure 11-28. View Configuration Screen

Figure 11-28 summarizes that currently five stand-alone ports without configurations and one group named Marcom are enabled.[1] Marcom is made up of three ports: Adptsf1, Adaptsf2, and Adapts3. The IPX protocol is assigned to Marcom using ETHERNET_802.2 as the frame type and 121212121 as the IPX Network Number.

2 Press **Esc** to return to the Main Menu.

3 Continue to *Copying and Saving the Configuration*.

[1] If the ports or group were disabled, **[Disabled]** would appear next to the port/group name.

Downloaded from www.Manualslib.com manuals search engine

Copying and Saving the Configuration

Once you have established and verified all port and group configurations in lbsetsf, you are ready to install program and configuration related files to the server.

1. From the Main Menu, select **Install Software**, and then press **Enter**.
2. In the Copy New Files box, select **Yes**, and then press **Enter**.

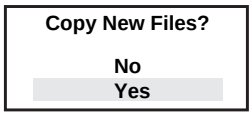

Figure 11-29. Copy New Files Box

3. From the Main Menu, press **Esc** to exit the program.
4. In the Save box, select **Save and Quit** to save the configuration in sys:\etc\configsf.ncf and quit the program.
   - If you do not want to save the changes, select **Quit without Saving**, and then press **Enter**.
   - If you wish to return to the Main Menu, select **Return to Previous Menu**, and then press **Enter**.
5. Restart the server.
   - In NetWare 4.x:
     a. At the system console prompt, type **Down,** and then press **Enter**.
     b. Type **Restart Server**.
   - In NetWare 5.0:
     a. At the system console prompt, type **restart server,** and then press **Enter**.
6. Continue to *Viewing System Status* on page 11-17.

Downloaded from www.Manualslib.com manuals search engine

Viewing System Status

Once you have installed Duralink64 Port Aggregation using lbsetsf, you can view the system status in the System Status screen. This program opens automatically whenever you restart the server.

- To manually enter the Status screen, at the system console prompt type:

  load status

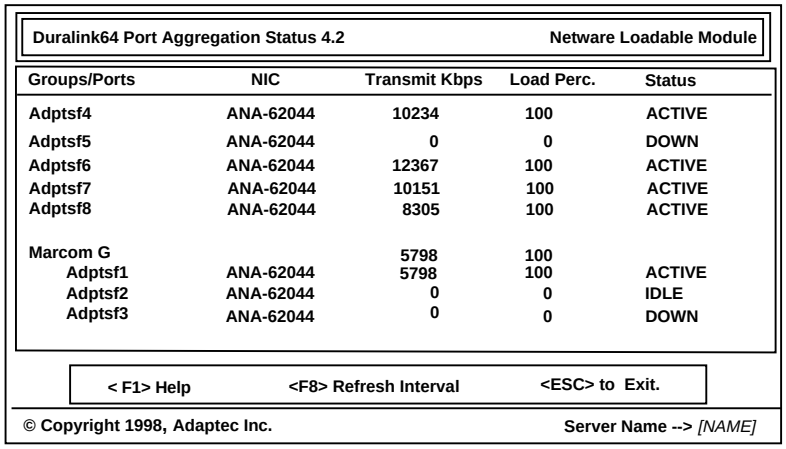

Figure 11-30. Data sample provided in the System Status screen.

System Status Data

- Adaptec NIC model number
- Total Kilobits / second (Kbps) transmitted per port (stand-alone and group). Total Kbps transmitted per group. The Kbps sum of aggregated ports in a group equals the total Kbps transmitted by their group.

Downloaded from www.Manualslib.com manuals search engine

- Percentage of transmit load carried by each port in a load balancing group. The percentage for a stand-alone port is always 100%. The percentage for a group is calculated as a percentage of bytes transmitted by the port over bytes transmitted by the group for a fixed period of time. (Use **F8** to adjust time intervals.)
- The present status of all ports and groups.
  - DOWN is displayed, f a link is down.
  - ACTIVE is displayed, if the link is up and has transmitted data within a time interval.
  - IDLE is displayed, if the link is up but the port has not transmitted any data within the time interval.

Setting Time Intervals

By default, the System Status screen refreshes every second. You may change the time interval using **F8**.

Modifying Driver Configurations

Once Duralink64 Port Aggregation is installed, use configsf to add, remove, or change a driver configuration for an Adaptec DuraLAN NIC.You will be familiar with the screens in this program since they are similar to the ones in lbsetsf.

1. At the system console prompt, type **load configsf.**
2. In the message screen indicating that ports were added / removed, press **Esc**.
3. Once you have opened configsf, refer to *Configuring Ports* for more instructions.

Downloaded from www.Manualslib.com manuals search engine

Removing Drivers

The following procedures are to be used if a new driver needs to be installed to replace an existing driver.

Removing the Duralink64 Port Aggregation Driver

To remove the Duralink64 Port Aggregation Driver use the following steps:

1. Insert the *Duralink64 Drivers For Netware disk*.
2. At the system console prompt, type l**oad a:\nwserver\setupsf** and press **Enter**.
3. Select Port Aggregation from the Adaptec window.
4. In the Main Menu, select **Uninstall Software**, and press **Enter**.
5. In the Uninstall the Software box, select **Yes** and press **Enter**.
6. In the Main Menu, Press **Esc** to exit setupsf.

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

12

Installing Duralink64 NetWare Client

In This Chapter

Installing Novell Client32	12-2
Connecting Clients to the NetWare Failover Server	12-6
Connecting Clients to the NetWare Port Aggregation Server	12-7

This chapter provides instructions for installing Duralink64 on a NetWare client.

Downloaded from www.Manualslib.com manuals search engine

Installing Novell Client32

DOS

This section provides instructions on installing the ADPTSF 32-bit driver for Novell Client32 using the ODI driver. Please note that DuraLAN products do not support 16-bit drivers.

1. Download the latest version of Novell NetWare Client32 via the Novell web site, www.novell.com.
2. Start DOS.
3. Insert your Novell NetWare Client32 package.
4. Type **install** and then press **Enter**.
5. Follow the instructions on your screen. Please refer to *Selecting Options* if you are not sure which option to select.
6. When you are done, you may confirm settings in *startnet.bat*.

Note: This installation setup assigns settings to one port only. To assign settings to multiple ports, you must edit startnet.bat. See *Editing startnet.bat* on page 12-4.

Downloaded from www.Manualslib.com manuals search engine

Selecting Options

This section provides the option you must choose in a given screen. These screens vary depending on which NetWare Client32 package you are using.

Screen Name/Message	Option
Client Installation	Choose either **NetWare Client32 for DOS and Windows 3.1x** or **IntranetWare DOS/Windows for DOS/Windows**.
Driver Type	Choose **32-Bit**.
32-Bit Network Board Drivers	Choose **User Specified 32 Bit Driver**. *Do not* choose Adaptec PCI Ethernet Driver Failover!
When asked to insert the NetWare Client32 for DOS/Windows 3.1x 32-bit disk	Insert the Duralan Driver for NetWare 4.x (disk 2 of 2), and then type **a:\nwserver**.
32-Bit Network Board Drivers	Choose **Adaptec DuraLAN Network Adapters**.
Settings for Adaptec DuraLAN Network Adapter	Set IOMAP to **1**. Set Connection Type to **Autodetect Default** or **None**.

Downloaded from www.Manualslib.com manuals search engine

Editing startnet.bat

To assign multiple ports, follow these steps:

1. Load c:\novell\client32\adptsf.lan.
2. In *startnet.bat*, type **slot=[port slot number]** at the end of each line. The following example shows the setting assigned to port 1:

   iomap=1 Frame=ETHERNET_802.2 slot=1
3. For the next port, enter

   iomap=1 Frame=[frame type] slot=[port slot number]

   To assign multiple frame types, repeat this step changing the frame type setting.
4. Repeat step 3 for each additional port.
5. Save your changes.
6. Exit *startnet.bat*.

Connecting Clients to the NetWare Server

Connecting clients to the NetWare Duralink64 server requires the NDIS driver. Do not use an ODI driver! See the appropriate section:

- *Connecting Clients to the NetWare Failover Server* on page 12-6.
- *Installing the NetWare Port Aggregation Driver* on page 11-3.

Downloaded from www.Manualslib.com manuals search engine

Windows

This section describes how to install the ADPTSF 32-bit driver for Novell Client32. Please note that Adaptec does not support 16-bit drivers.

Note: This procedure requires the NDIS driver with Client32. Do not use an ODI driver!

1. If you are using Windows NT 4.0, install the Microsoft Windows NT Service Pack 3 or later and then restart the system.
2. Install the DuraLAN Standard driver. Instructions are provided in *Installing the NetWare Standard Driver* on page 9-4.
3. Install the Client32 software, see your Novell documentation for instructions.

Connecting Clients to the NetWare Server

Connecting clients to the NetWare Duralink64 server requires the NDIS driver. Do not use an ODI driver! See the appropriate section:

- *Installing the NetWare Failover Driver* on page 10-3.
- *Installing the NetWare Port Aggregation Driver* on page 11-3.

Downloaded from www.Manualslib.com manuals search engine

Connecting Clients to the NetWare Failover Server

For optimum performance of NetWare Duralink64 Failover, all clients (any brand) should increase their IPX retry count.

- For DOS clients using VLM or Novell Client32

  Type the following lines in *net.cfg* (indent the second line):

  protocol ipx

  ipx retry count = 255

- For Windows 95 Clients using Novell Client32

  From the Control Panel, locate NetWare Clients, and then enter **255** under the **IPX retry count** in the IPX 32-bit Protocol tab.

- For Windows NT Clients using Novell Client32

  Set the IPX retry count in the registry in NetWareWorkstation Parameters. Use the following steps:

  a From the DOS prompt, type **regedit** to enter the Registry Editor.

  b Double-click **hkey_local_machine**.

  c Double-click **System**.

  d Double-click **CurrentControlSet**.

  e Double-click **Services**.

  f Double-click **NetWare Workstation**.

  g Double-click **Parameters**.

  h Double-click **Retry Count** to enter the Edit DWORD Value menu.

  i Change base to decimal, and then change value data to 255.

  j Click **OK**.

  k Close the Registry Editor.

  l Restart the system.

Downloaded from www.Manualslib.com manuals search engine

Connecting Clients to the NetWare Port Aggregation Server

For optimum performance of NetWare Duralink64 Port Aggregation, all clients (any brand) should increase their IPX retry count.

- For DOS clients using VLM or Novell Client32

  Type the following lines in *net.cfg* (indent the second line):

  protocol ipx

  ipx retry count = 255

- For Windows 95 Clients using Novell Client32

  From the Control Panel, locate NetWare Clients, and then enter **255** under the **IPX retry count** in the IPX 32-bit Protocol tab.

- For Windows NT Clients using Novell Client32

  Set the IPX retry count in the registry in NetWare Workstation Parameters. Use the following steps:

  a From the DOS prompt, type **regedit** to enter the Registry Editor.

  b Double-click **hkey_local_machine**.

  c Double-click **System**.

  d Double-click **CurrentControlSet**.

  e Double-click **Services**.

  f Double-click **NetWare Workstation**.

  g Double-click **Parameters**.

  h Double-click **Retry Count** to enter the Edit DWORD Value menu.

  i Change base to decimal, and then change value data to 255.

  j Click **OK**.

  k Close the Registry Editor.

  l Restart the system.

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

▼▼▼▼ Part 5

Appendices

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

A

Cables and LEDs

This section is not intended to be an exhaustive explanation of connecting Ethernet networks but will provide some useful information on cabling suitable for Adaptec DuraLAN NICs.

The following table outlines the two cable specifications of IEEE 802.3u: 100BASE-TX and 100BASE-FX.

	100BASE-TX	100BASE-FX
Cable supported	CAT 5 UTP	62.5 / 125 multimode fiber
Number of cable pairs	2	1
Node-to-repeater cabling distance	100 meters	137 meters
Node-to-switch to full duplex	100 meters	2000 meters

Downloaded from www.Manualslib.com manuals search engine

Connection Types

Here are some of the possible connection type options given when configuring NICs. The options vary depending which operating system the NIC is being configured on.

- Autodetect Default Connection

  Detects the cable type, optimal line speed, and duplexity for the specific Adaptec PCI NIC model in use. This is the default and recommended connection type.

- 10 Mbps UTP / Half Duplex

  Forces the connection to 10 Mbps in Half Duplex mode.

- 100 Mbps TX / Half Duplex

  Forces the connection to 100 Mbps in Half Duplex mode.

- 10 Mbps UTP / Full Duplex

  Forces the connection to 10 Mbps in Full Duplex mode.

- 100 MbpsTX / Full Duplex

  Forces the connection to 100 Mbps in Full Duplex mode.

Full Duplex Support

To implement Full Duplex on your network, you need both a NIC and a switch that supports Full Duplex. Full Duplex support allows a NIC to send and receive data at the same time, doubling available bandwidth.

Note: Full Duplex can also be enabled point-to-point with a crossover cable instead of a switch.

Installation instructions in this user's guide describe how to enable Full Duplex. Additional information can be found in the *readme.txt* files. Adaptec PCI TX NICs support Full Duplex at both 10 Mbps and 100 Mbps.

Downloaded from www.Manualslib.com manuals search engine

Cable Requirements

Cable requirements for Adaptec DuraLAN NICs vary according to network speed, cabling standard, and the connector to be used. The table below identifies appropriate cabling, based on these variables. The table applies to both Half Duplex and Full Duplex (for selected models) environments.

NIC	Connector	10 Mbps	100 Mbps	Cable Pins Used
TX Adapters	RJ-45	CAT 3,4,5 UTP	CAT 5 UTP,	1,2,3, 6
FX Adapters	ST	N / A	62.5 / 125 micron multimode fiber	N / A
	SC	N / A	62.5 / 125 micron multimode fiber	N / A

Downloaded from www.Manualslib.com manuals search engine

Straight-through Cable

The majority of twisted-pair environments use twisted-pair cables that are wired straight-through. This means that each pin of the modular plug connector is wired to the same pin on the opposite end of the cable (i.e., pin 1 is wired to pin 1). Straight-through cables connect workstations and servers to repeaters and switches. Cables for 100BASE-TX use two pairs (pins 1, 2, 3, and 6).

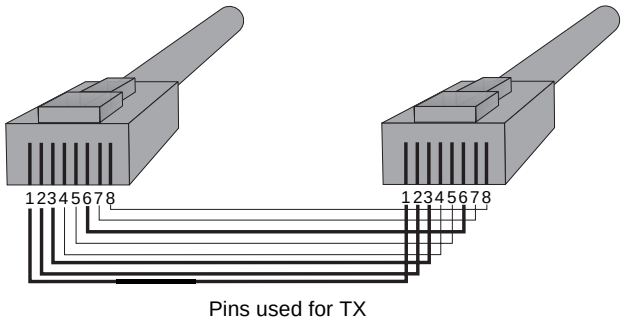

Figure A-1. Straight-through Cable

Downloaded from www.Manualslib.com manuals search engine

Pinout and Color Requirements

Straight-through Cable - 10BASE-T or 100BASE-TX	
Pin	**Colors - Both Ends**
1	Orange White
2	Orange
3	Green White
4	Blue
5	Blue White
6	Green
7	Brown White
8	Brown

Diagnostics Loop-Back Cable

The following pin-outs are used for Diagnostics external and autonegotiation tests. Refer to the *Diagnostic Tests* on page D-3.

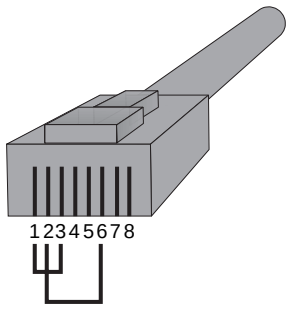

Figure A-2. Loop-back Cable

Downloaded from www.Manualslib.com manuals search engine

Diagnostic LEDs

Diagnostic Light Emitting Diodes (LEDs) provide information about link status (ls) and network activity (act). The figure below shows the locations of LEDs for each board. See the descriptions on the following page for details on each LED display.

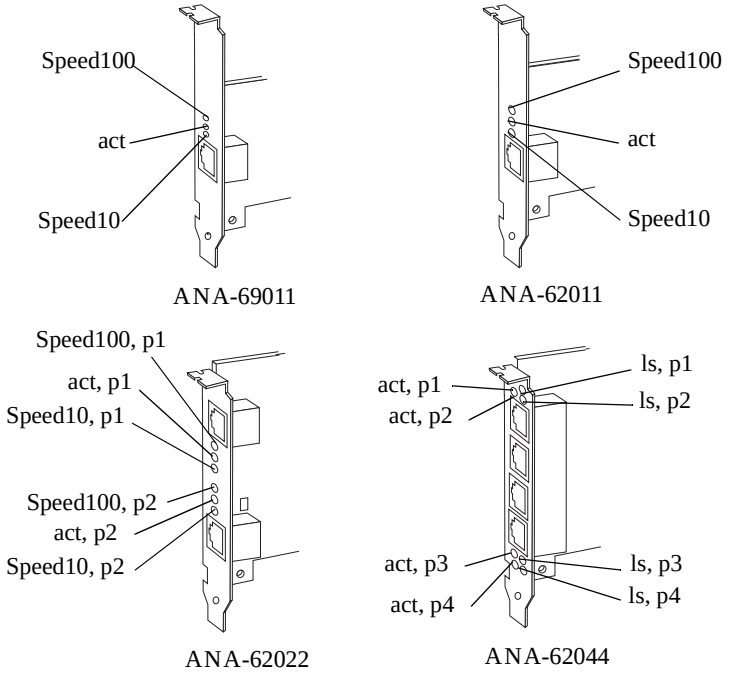

Figure A-3. act = network activity, p = port, ls = link status

Downloaded from www.Manualslib.com manuals search engine

LED Functions

For ANA-69011, ANA-62011, and ANA-62022:

- Speed100

  The Speed100 LED is green. When ON, it indicates that a valid 100 Mbps link has been made.

- Speed10

  The Speed10 LED is green. When ON, it indicates that a valid 10 Mbps link has been made. When OFF, no 10 Mbps link has been made.

- ACT

  The ACT LED is amber. The ACT LED lights up to signal the presence of incoming or outgoing traffic.

For ANA-62044:

- LS

  When ON and green, it indicates that a valid 100 Mbps link has been made. When ON and amber, it indicates that a valid 10 Mbps link has been made. When OFF, no valid link has been made.

- ACT

  The ACT LED is amber. The ACT LED lights up to signal the presence of incoming or outgoing traffic.

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

▼▼▼▼B

Troubleshooting Tips

This appendix explains how to troubleshoot problems with your DuraLAN NIC. If your NIC is not functioning properly, first make sure that it was set up according to instructions in this User's Guide.

1. Verify that your NIC is installed properly and configured correctly, see Chapter 3, *DuraLAN NIC Installation*.
2. Verify that your network is properly cabled and the NIC is properly connected (see *Connecting the Network Cable* on page 3-6 and Appendix A, *Cables and LEDs*).
3. Verify that the DuraLAN driver is installed correctly (see Part 2, *Installing the DuraLAN NIC*, or Part 3, *The DuraLink64 Driver for Windows*).
4. Verify that you are using the latest BIOS for your computer, and the latest DuraLAN driver.
5. Verify that your cable, terminators, and connectors are functioning properly, or install the NIC in a different slot.
6. See *Adaptec Technical Support and Services* on page ii if you still have trouble.

Downloaded from www.Manualslib.com manuals search engine

Isolating Faulty Hardware

If the problem persists, try the following:

- Replace the NIC with the same type of Adaptec NIC which is known to work. If the new NIC functions properly, the problem is related to the original NIC.
- Install the NIC in another functioning computer and run the tests again. If the NIC works in this machine, the problem is related to one of three areas:
  - The computer is faulty
  - There is a hardware conflict
  - There are problems with the cables or connectors

Troubleshooting

Use the following table to help answer common questions. For more information on FAQs, see the *www.adaptec.com* support site.

Symptom	Solution
Adaptec NIC is conflicting with an installed PCI SCSI Adapter.	Configure the NIC and SCSI adapters to use different interrupts via BIOS, System Configuration Utility (SCU), or EISA Configuration Utility (ECU) provided by the system vendor.
Workstations cannot connect to the NetWare server.	■ Make sure the workstation and server are using the same frame type. ■ Add the following two lines to the NetWare Server *startup.ncf* file: **set minimum packet receive buffers=512** **set maximum packet receive buffers=1024** ■ For Failover and Port Aggregation NetWare servers, verify that IPX retry count= 255 is on each workstation. See *Connecting Clients to the NetWare Failover Server* on page 12-6.
Error messages during NetWare Driver installation.	Install NetWare service pack 6(iwsp6) or later, select ODI 3.31 specification, and then install the DuraLAN NIC driver.

Downloaded from www.Manualslib.com manuals search engine

Symptom	Solution
Driver fails to load or fails to recognize the DuraLAN NIC	Check the BIOS settings. Sometimes the bus master is disabled by default; therefore, enable the bus master.
Persistent problems with an adapter card set to IRQ 15.	This occurs in Novell NetWare. Either disable IRQ 15 or change the Adaptec DuraLAN NIC to another interrupt. Please refer to your Novell documentation.
System hangs at boot up.	Make sure the DuraLAN NIC is seated properly in the PCI slot. Check your system vendor for the latest BIOS.
LED does not light when running autonegotiation in the Diagnostics utility.	Use a loop-back cable, see *Diagnostics Loop-Back Cable* on page A-5.

Downloaded from www.Manualslib.com manuals search engine

Configuring the BIOS

Your system BIOS *may* determine available NIC resources and configure the Adaptec PCI NICs automatically. However, depending on your system, you may need to configure the PCI BIOS. To do this, enter your computer BIOS Setup and select **Advanced Settings** from the Main Menu. Make sure the following settings are made (your BIOS may not match the following options exactly):

Option	Setting
PCI Slot Enabled	Enable all PCI slots in your system.
Bus Mastering	Enable PCI bus mastering for the slot(s) to be used by the NICs.
PCI INTA	For the 6x011, assign an interrupt (10, 11, 12, etc.) to PCI Interrupt Vector A.
PCI INTA-B	For the 6x022, assign an interrupt (10,11, 12, etc.) to PCI Interrupt Vector A or B.
PCI INTA-D	For the 6x044, assign an interrupt (10,11, 12, etc.) to PCI Interrupt Vector A - D.
PCI Bus Latency	Set to a value between 40 and 80.

Two-and-four port NICs use a PCI-to-PCI bridge chip. If your system's BIOS does not support the PCI-to-PCI bridge chip these NICs will not be configured properly. Contact your computer manufacturer to obtain a new BIOS version that supports the PCI-to-PCI bridge chip.

Downloaded from www.Manualslib.com manuals search engine

Frequently Asked Questions

Duralink64 Software And DuraLAN NICs - General Questions

1 What is Duralink64 v4.2 software?

Adaptec's innovative Duralink64 software includes Duralink64 standalone drivers, Port Aggregation, Failover, and Server Manager software and is supported by Adaptec's DuraLAN 32 and 64-bit NICs. Duralink Port Aggregation software makes it possible to aggregate the outbound bandwidth of 2 to 12 Fast Ethernet ports into one virtual network interface for up to 1.2 Gbps of total throughput per workgroup. Duralink64 Failover Software offers FDDI-like port resiliency for optimum availability, and safe, fault-tolerant Fast Ethernet networks. Duralink Server Manager is a robust utility that uses standard protocols, and graphically displays the status of each Adaptec NIC attached to the server.

2 How do the standalone, Port Aggregation, and Failover drivers differ?

The Duralink64 standalone driver is the minimum software required for DuraLAN NICs. Duralink64 Port Aggregation software groups up to 12 Fast Ethernet ports onto a single aggregated connection operating up to 1.2 Gbps per workgroup. Duralink Failover software is an application that automatically reacts to preserve a network connection if an Ethernet link fails.

3 Which Adaptec NICs support the Duralink64 v4.2 software suite?

Adaptec's Duralink64 standalone drivers, Port Aggregation, Failover and Server Manager is supported by the ANA-69011/TX, ANA-62011/TX, ANA-62022, and ANA-62044.

Downloaded from www.Manualslib.com manuals search engine

4 Can I use the Adaptec Duralink64 v4.2 software with NICS from other vendors?

Duralink64 v4.2 software only works with Adaptec PCI 10/100 DuraLAN NICs but is fully interoperable with other products from other vendors.

5 Which protocols work with Duralink64 v4.2 software and my DuraLAN NICs?

TCP/IP and NetBEUI under Windows NT and TCP/IP and IPX/SPX under NetWare.

6 Does Duralink64 v4.2 software or the DuraLAN NICs support AppleTalk?

No

7 Does Duralink64 v4.2 or my DuraLAN NIC support routing?

Routing functionality is provided by network operating systems, and not by NICs themselves. The NIC can be used with server operating systems (like Novell NetWare and Windows NT) that support routing.

8 What is the difference between the Duralink64 v4.2 and Duralink v3.0 software?

Duralink64 v4.2 is the software written for Adaptec's DuraLAN ASIC (used on the ANA-69011/TX, ANA-62011/TX, ANA-62022, and ANA-62044). Duralink v3.0 is the software written for Adaptec's legacy NICs based on the DEC/Intel ASICs (used on the ANA-6911A/XX, ANA-6922A/XX, and ANA-6944A &B/XX.

9 Can I use the Duralink64 v4.2 software with the legacy Adaptec DEC-based NICs?

No. The Duralink64 v4.2 software is written only for the new Adaptec DuraLAN NICs and will not support the legacy Adaptec DEC-based NICs. You can use both cards in one system if you load both the Duralink64 v4.2 and Duralink v3.0 software. However, you can not mix and match Adaptec legacy DEC-based cards and Adaptec DuraLAN cards in a single port aggregation or failover group.

Downloaded from www.Manualslib.com manuals search engine

Duralink64 v4.2 Failover Software Questions

1 What is Duralink64 Failover software?

Duralink64 Failover software is a network device application that automatically reacts to preserve a network connection when an Ethernet link fails. Duralink64 Failover supports mission-critical applications by activating a standby link in the event of failure, providing increased uptime and maintaining server availability. The driver establishes an active and a hot-standby link. Once the active link goes down, the standby one becomes active. The standby link is activated when the following conditions occur on the primary link: link loss, the driver loses contact with the NIC's “keep alive” mechanism, abnormal hardware interrupt occurs, the port becomes unable to transmit for a specified time, or abnormal send and receive counters occur, such as too many collisions or errors on the segment.

2 Which protocols work with Duralin64 Failover?

TCP/IP and NetBEUI under Windows NT and TCP/IP and IPX/SPX under NetWare.

3 Is Duralink64 software interoperable/compatible with other vendors' NICs and network devices?

Duralink software only works with Adaptec DuraLAN NICs but is fully interoperable with network devices (such as switches and hubs) from other vendors.

4 Does Duralink64 Failover work with a switch or a hub?

Duralink64 Failover works with any switch or any hub.

5 How many ports can I configure for the failover group?

Two ports per failover group. Within each group, only one port can be used as the primary or active port and only one port can be used as the backup or standby port.

6 What happens during failover?

The driver momentarily halts data transmission, does error checking, transfers the MAC address of the primary port to the backup port, enables the backup port for data transmissions, and continues to transmit data on the backup port.

Downloaded from www.Manualslib.com manuals search engine

7 If I have the Duralin64 standalone drivers installed and want to install the Failover drivers, what do I need to do?

You must uninstall or remove the Duralink64 standalone drivers and reboot the system. Then you can install the Duralink64 Failover drivers.

Duralink64 v4.2 Port Aggregation Software Questions

1 What is Duralink64 Port Aggregation software?

Adaptec's Duralink64 Port Aggregation technology builds upon standards-based Fast Ethernet to provide network managers a reliable high-speed solution for the network backbone. Duralink64 Port Aggregation software groups up to 12 Fast Ethernet ports onto a single aggregated connection operating up to 1.2 Gbps per workgroup. See the Port Aggregation white paper on the Adaptec web site (http://www.adaptec.com).

2 What are the key benefits of Duralink64 Port Aggregation software?

- Network scalability
- Increases bandwidth by adding ports
- Allows segmentation of the network as needed by grouping ports
- Adds fault tolerance by design

3 What applications or environments call for Duralink64 Port Aggregation?

Applications or environments that require Duralink64 Port Aggregation include servers that have large numbers of clients or download large amounts of data, such as application and video servers.

Downloaded from www.Manualslib.com manuals search engine

4 How does Duralink64 Port Aggregation work?

For all protocols, Duralink64 Port Aggregation effectively balances transmit traffic among all ports of an aggregation group. The Port Aggregation driver assigns a primary port to the aggregation group and the protocol binds to that port. To the protocol, the primary port is the only port. However, the driver uses all the ports in the group to transmit packets to the clients. Packets are generally received by the server via the primary port, but in the case of NetBEUI, all ports receive and transmit.

Duralink64 Port Aggregation requires connection to a switch in order for the ports to be aggregated as one logical link

5 How does the failover portion of Duralink64 Port Aggregation work?

Network fault tolerance means that a specific portion of the network is able to tolerate a failure. Fault tolerance is a built-in feature of the Duralink64 Port Aggregation product because there are at least two contributing members of each aggregation group. It is highly improbable that the server connection will fail in this context.

If one port fails, the duties associated with the failed port are redistributed to other members of the aggregation group. If the primary port fails, another member of the group is assigned the primary port's MAC address, minimizing impact to routers and their routing tables. If the primary port comes back online, the primary port's address is reassigned back to the primary port.

6 What NICs support Duralink64 Port Aggregation?

Adaptec's ANA-69011/TX, ANA-62011/TX, ANA-62022, and ANA-62044 NICs support Duralink64 Port Aggregation.

7 Which network switches support Duralink64 Port Aggregation?

Duralink64 Port Aggregation has been tested with all the leading vendors' switches. Duralink64 Port Aggregation requires connection to a switch in order for the ports to be aggregated as one logical link.

Downloaded from www.Manualslib.com manuals search engine

8 Which protocols and operating systems work with Duralink64 Port Aggregation?

Adaptec's Port Aggregation driver works with TCP/IP and NetBEUI under Windows NT and TCP/IP and IPX/SPX under NetWare.

9 Does Duralink64 Port Aggregation support multiple VLANs?

Only one VLAN is supported per aggregated group or per port.

10 How does Duralink64 Port Aggregation compare to Cisco's Fast EtherChannel?

Both Duralink64 Port Aggregation and Cisco's Fast EtherChannel are proprietary. Cisco's Fast EtherChannel focuses on increasing bandwidth between Cisco switches while Adaptec's Port Aggregation focuses on increasing bandwidth between server and switch connections, to increase server availability to clients. Each port on Cisco's Fast EtherChannel module can be configured to Fast EtherChannel mode or Fast Ethernet mode. (Fast EtherChannel mode allows you to group up to four ports from one Fast EtherChannel module to another Fast EtherChannel module in different Cisco switches.)

11 Does Duralink64 Port Aggregation support Cisco's Fast EtherChannel?

Yes.

12 Where can I learn more about Duralink64 Port Aggregation?

Go to the Adaptec web site at: http://www.adaptec.com.

Duralink64 v4.2 Windows NT - General Questions

1 Which service pack has been tested with DuraLAN and Duralink Failover 4.0 drivers?

Windows NT Service Pack 3 (SP3). Microsoft generally recommends installing SP3 on all NT systems. Before installing duralink64 v4.2 software, be sure to install SP3.

Downloaded from www.Manualslib.com manuals search engine

Note: Duralink64 software may not work properly with SP1 or SP2.

2 Where are the NT drivers on the diskette?

The standalone drivers are at the root directory (a:\). The Failover drivers are in the a:\NtFailover\i386 directory.

3 Does Duralink64 v4.2 support Novell's 32-bit client for Windows NT?

Yes. However, connecting clients to the NetWare Duralink64 server requires the NDIS driver. Do not use an ADI driver. See the *User's Guide Windows NT Installation* section for details.

4 How can I determine the status of a failover group under Windows NT?

You can view the status of any failover group using the status screen (Control Panel, Network Adapters, Status tab).

5 Do the Duralink64 v4.2 Failover drivers support Appletalk under Windows NT?

No.

Duralink64 v4.2 Windows 95 and Windows 98 - General Questions

Windows 95

1 How do I install Duralink64 v4.2 software on my Windows 95 system?

First, you must determine which version of Windows 95 is installed on your system, OSR1 or OSR2. Right Click on **My Computer** and select **Properties**. You should see Windows 95 on the screen and 00.950 x under it. The A represents OSR1. The B represents OSR2.

2 Which Duralink64 software should I use with Windows 95 OSR1?

Use the software on the disk in the directory labeled Win95a (a:\win95a).

Downloaded from www.Manualslib.com manuals search engine

3 Which Duralink64 software should I use with Windows 95 OSR2?

Use the software at the root directory on the disk (a:\).

4 Does Duralink64 v4.2 support Novell's 32-bit client for Windows 95?

Yes. However, connecting clients to the NetWare Duralink64 server requires the NDIS driver. Do not use an ADI driver. See the *User's Guide Windows 95 Installation* section for details.

Windows 98

1 How do I install Duralink64 v4.2 software on my Windows 98 system?

Follow the standard Windows 98 Hardware Installation procedure using the Have Disk option.

Duralink64 v4.2 NetWare - General Questions

1 I used Load Install to try to load my NIC and it's not working. What do I do?

For standalone, Failover, or Port Aggregation drivers, use Setupsf from the Duralink64 v4.2 NetWare diskette.

2 What version of the service pack do I need for Duralink64 v4.2 software?

Use service pack 6 and ODI 3.31 patches for NetWare 4.11 for all DuraLAN drivers. If these patches are not applied to NetWare before installing DuraLAN drivers, the drivers will not work.

3 What do I do when upgrading from Duralink64 v4.2 standalone drivers to Duralink64 v4.2 Failover drivers?

Use setupsf to remove existing standalone drivers from the system. Use Setupsf from the Duralink64 v4.2 NetWare diskette to install the new Failover drivers.

Downloaded from www.Manualslib.com manuals search engine

4 It's not clear what should be done from the Failover Setup Menu. How do I configure the ports?

To install the Duralink64 v4.2 Failover software on NetWare v4.11 or v4.2, use Setupsf from the Duralink64 v4.2 NetWare diskette. At the main menu, select **Failover**, then, Configure Ports, Set Failover Pairs, Configure Protocols, Install Software and then Save and Exit. Make sure you follow this sequence and end with Save and Exit. The Save and Exit function modifies the autoexec.ncf file so that the Failover software is loaded each time you boot the server.

5 How do I install Duralink64 v4.2 Failover or Port Aggregation if I currently have the Duralink64 v4.2 standalone drivers installed?

The setupsf file is used only when installing and uninstalling Duralink64 v4.2 Failover or Port Aggregation software. The Configsf file is also used after installation for changing the failover configuration.

6 Does Duralink64 v4.2 support Novell's 32-bit client for Windows 95, Windows 98, or Windows NT?

Yes. However, connecting clients to the NetWare Duralink64 server requires the NDIS driver. Do not use an ODI driver. See the *User's Guide Windows 95, Windows 98*, or *Windows NT Installation* sections for details.

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

C

Duralink SNMP Agents

Windows NT and NetWare SNMP agents are provided to support failover and port aggregation capabilities. These agents handle standard port configurations, Failover pairs, and Port Aggregation. Use of the agents allow remote monitoring from any standard network management station with SNMP (version 1) support.

The following information is provided:

- **Information group**—containing card, port, and interface counts.
- **Interface statistics table**—listing characteristics and summary statistics for individual port interfaces, failover groups, and multiple port load balancing groups.
- **Port statistics table**—listing all ports grouped by interface and providing characteristics and statistics for each individual port. Port 1 in any multiple group is always the port that is available to be bound to protocol stacks.
- **Card information table**—describing each Adaptec network card on the system.
- **Card port information table**—sorted by network card listing all ports and the interface to which they are assigned.
- **Trap definition**—for traps that are generated when the status of any port changes.

Downloaded from www.Manualslib.com manuals search engine

Monitoring the NICs by SNMP

The *duralink.mib* file must be compiled on the SNMP Management station to manage the NICs. This file is located on the Duralink64 for Windows diskette, in the *snmpmibs* directory. Please refer to the *Duralink Manager Server User's Guide*.

SNMP Support

The message !SNMP service is not installed will appear during the installation and configuration of NT if SNMP service is not installed. If SNMP functionality is not desired, ignore this message. If SNMP is desired, install SNMP Service using the Windows NT CD, and then reinstall service pack 3.

The driver installation enables an SNMP agent to provide management information to the SNMP management station. The agent supports both the DuraLAN and older EMPCI NICs. However, if you install your EMPCI drivers after the DuraLAN installation, management information is restricted to the EMPCI configuration.

The MIB file used for your SNMP management console or when using the Duralink Server Manager is located in the following directory: a:\snmpmibs\duralink.mib. After compiling this file on an SNMP management station you will then receive traps or events relative to the DuraLAN network adapter.

Downloaded from www.Manualslib.com manuals search engine

▼▼▼▼D

The Diagnostics Utility

Your Adaptec DuraLAN NIC is supplied with a DOS diagnostics utility which is found on the LAN and Duralink64 Failover Drivers NetWare disk. Use the diagnostics utility to check the functionality of your DuraLAN NICs.

Downloaded from www.Manualslib.com manuals search engine

Running the Diagnostics

From the Hard Drive

Use the following steps to run the Diagnostics utility from your hard drive:

1. Make sure *himem.sys* and *emm386.exe* are currently in *config.sys* and that **files=30** is present.

   If they are not, add the following lines to the top of the *config.sys* file:

   ```
   device=c:\dos\himem.sys
   device=c:\dos\emm386.exe /noems
   files=30
   ```

   Type the path to the DOS programs if it is not found in *c:\dos*.

2. Create a directory for the diagnostics on your hard drive.
3. Copy all files in this directory to the new diagnostics directory of the hard drive.
4. At the DOS prompt, type **go_diags** and then press **Enter**.

Note: The easiest way of testing a DuraLAN NIC is running the Selftest.

From the Floppy Drive

To prepare a DOS diagnostics boot diskette, use the following steps:

1. Create a bootable DOS diskette.
2. Copy the DOS files *himem.sys* and *emm386.exe* to the diskette.
3. Copy all the files in this directory to the root directory of the DOS boot diskette.
4. Start the system from the floppy diskette.
5. At the DOS prompt, type **go_diags** and then press **Enter**.

Downloaded from www.Manualslib.com manuals search engine

Tip: The easiest way of testing a DuraLAN NIC is running the Selftest.

Diagnostic Tests

The following table lists the tests which can be run on the Adaptec DuraLAN Fast Ethernet NIC(s). The diagnostics commands are case sensitive, please type these commands as they appear in the table.

Command	Test
selftest	Verifies a variety of card functions. You should run this test first to isolate common errors.
port *X*	Specifies the port you want to test. If more than one DuraLAN NIC is installed, remove all cards and then test one card at a time.
display	Displays values of all chip registers.
loop	Performs multiple tests consecutively. At the last line before you run the tests, type **end**. For example: Loop>port 1 Loop>selftest Loop>port 2 Loop>selftest Loop>end
eeprom	Tests contents of serial eeprom and displays it on screen.
exit	Exits the diagnostics utility.
hbi_slave	Tests slave accesses, checks serial eeprom, and checks register accesses to the chip.
hbi_dma	Checks dma transfers to and from the board.
mac	Tests registers and various functions of Ethernet controller.
address_filter	Tests ethernet packet filtering capabilities.
internal_10_mac	Tests internal loop-back at 10 Mbps within the chip.

Downloaded from www.Manualslib.com manuals search engine

Command	Test
internal_100_mac	Test internal loop-back at 100 Mbps within the chip.
internal_10_phy	Tests loop-back from the physical device at 10 Mbps.
internal_100_phy	Tests loop-back from the physical device at 100 Mbps.
external_10	This test requires a loop-back cable. It tests the loop-back from the cable at 10 Mbps.
external_100	This test requires a loop-back cable. It tests the loop-back from the cable at 100 Mbps.
autonegotiate <speed> (speed is one of five options)	Tests the speed the card negotiates. This test has five options: 0 — Tests for full autonegotiation (highest speed) 10 — Forces test at 10 Mbps half duplex 20 — Forces test at 10 Mbps full duplex 100 — Forces test at 100 Mbps half duplex 200 — Forces test at 100 Mbps full duplex **Note:** Requires a hub, switch, or loop-back cable. Also, autonegotiate defaults to 10MBytes if the cable is not connected.
checksum	Tests the abilitiy to calculate TCP / IP checksum.
statistics	Verifies statistics gathering features of the chip.
echoer # / sender # (where # is the number of packets to send)	This test requires two computers on a private network: one as the sender, and the other as the echoer. This test is useful for testing the network and verifying that data is being passed between the echoer and the sender. Enter the echoer command first, and then enter the sender command in the sender system. *(This command sequence is critical!)* The two commands work in tandem. The echoer system displays the number of packets received and then exits. The sender system displays a summary of packets transmitted and received, corrupted packets, number of collisions, and lost packets.
pause	Tests the flow controller features of the chip.
mem (default)	Slave access set to memory mode.
io	Slave access set to io mode.

Downloaded from www.Manualslib.com manuals search engine

Command	Test
timer	Tests the interrupt delay time feature of the Ethernet controller.
power-management	Tests the power down features of the Ethernet controller.
mod (mac offset data)	Allows the modification of the Ethernet controller registers.
help or ?	Displays all diagnostics commands.

❒

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

▼▼▼▼ Index

100BASE-FX A-1

A

Adding or Removing Ports 8-14
ANA-62011 1-6, 1-7
ANA-62022 1-6, 1-7
ANA-62044 1-6, 1-7
ANA-69011 1-6, 1-7

B

Bios Setup B-4

C

Cables
  Pinout and Color Requirements A-5
  Requirements A-3
  Twisted Pair
    Straight-through A-4
clients
  connecting to the Failover server 12-6
  connecting to the Port Aggregation server 12-7
Configuring Failover Pairs
  NetWare 10-6
  Windows NT 4.0 7-3
Configuring Ports
  NetWare with Duralink 9-5, 10-4
  Windows 95 6-4
  Windows NT 3.51/4.0 7-2
  Windows NT with Duralink 6-2, 7-2
Configuring ports
  Windows NT 8-2
Configuring Protocols
  NetWare with Duralink 10-9
Connection Types A-2
creating groups
  Fast EtherChannel 8-8
  Port Aggregation 8-4
  Port Aggregation for NetWare 11-6
creating groupsFast EtherChannel for NetWare 11-9
creating Port Aggregation groups
  creating groups 8-4
creating the Failover Pair 7-3

D

Diagnostic LEDs
  Details A-6
driver configuration
  standard for Windows 6-2
Drivers
  removing 5-13
Duo NICs 1-4, 1-9
DuraLAN driver installation
  Windows 95 5-9
  Windows 98 5-8
  Windows NT 3.51 5-6
  Windows NT 4.0 5-3
DuraLAN NIC
  about 3-3
  installation 3-4
Duralink GUI
  Windows NT 6-2, 7-2, 8-2
Duralink Port Aggregation
  description of 1-7

Downloaded from www.Manualslib.com manuals search engine

Duralink Software Installation
NetWare 10-1
NetWare Client 12-1
Windows NT 5-1, 7-1

E

Event Viewer Dialog Box 7-8

F

F Keys
NetWare 10-15
Failover driver installaion
NetWare 10-3
Failover pair
creating 7-3
Fast EtherChannel
creating groups 8-8
Fast Ethernet 1-3
FEC 8-8
network cofigurations 2-2
FEC for NetWare 11-9

H

hardware requirements 1-2

I

IEEE 1-3
Installation 3-1
NICs, Installing 3-1
Installation Tips 5-11
IPX address 11-12

L

LEDs
see Diagnostic LEDs

M

modifying drivers
NetWare 10-16
monitoring Failover pairs 7-8

N

NetWare
connecting clients to Failover 12-6
connecting clients to Port Aggregation 12-7
driver configuration modification 10-16
Duralink Software Installation 10-1
Duralink software installation 11-1
Failover driver installation 10-3
LAN Driver Installation 9-1
Port Aggregation driver 11-3
removing drivers 9-12, 10-17, 11-19
standard driver configuration 9-4
NetWare 5.0 9-3
NetWare Client
Duralink Software Installation 12-1
network cable connection 3-6
network cofigurations 2-2
Network Configuration
Description 4-1
Dual Hubs 4-4
Dual Hubs with Four Port NIC 4-7
Dual Hubs with Routers 4-6
Dual Hubs with Switch 4-5
Single Hub 4-3
Network configuration
Port Aggregation described 2-5
Windows NT utility 8-13
NIC Drivers,DuraLAN Standard Driver 3-8
NIC Drivers,Duralink64 Failover 3-8

Downloaded from www.Manualslib.com manuals search engine

NIC Drivers,Duralink64 Port Aggregation 3-8
NICs
Duo Port 1-4, 1-9
Quad Port 1-5
Single Port, 32 bit 1-3
Single Port, 64 bit 1-4
Novell 1-6, 1-7
Novell Client32
installation 12-2

P

Performance monitor
Windows NT only 8-20
Port Aggregation
creating groups 8-4
NetWare 11-3
network configurations 2-2
port configuration
NT 3.51/4.0 7-2

Q

Quartet NICs 1-4, 1-9

R

Removing drivers
NetWare 9-12, 10-17, 11-19
Windows NT 3.51 5-14
Windows NT 4.0 5-13
Windows NT 95/98 5-14
Removing NICs
Windows 95 5-10
renaming groups 8-13
requirements,hardware 1-2
requirements,software 1-2

S

Saving Configurations
NetWare 9-11, 10-13
SNMP Manager 7-8
Software installation
NetWare 11-1
Windows NT 8-1
software requirements 1-2
standard driver configuration
NetWare 9-4
NT 4.0/3.51 6-2
status 10-14
System Requirements 1-9
system requirements 1-2
System status
Windows NT 8-17

T

TCP/IP address
setting in NetWare 11-12
setting in Windows NT 8-11
Troubleshooting B-2
Isolating Faulty Hardware B-2
Troubleshooting B-2
Typographic Conventions 1-9

V

View configuration 11-15
Viewing Configuration
NetWare 9-10, 10-12
Viewing System Status
NetWare 10-14

W

Windows NT 1-6, 1-7
Duralink Software Installation 5-1, 7-1
performance monitor 8-20
software installation 8-1

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine

Downloaded from www.Manualslib.com manuals search engine